



**Cuestión 4 del
Orden del Día:**

Evaluación de los requisitos operacionales para determinar la implantación de mejoras de las capacidades de comunicaciones, navegación y vigilancia (CNS) para operaciones en ruta y área terminal

**ENCUESTA SOBRE CAPACIDAD CNS DE AERONAVES QUE OPERAN EN
LAS AMÉRICAS Y ATLÁNTICO NORTE**

(Presentada por IATA)

RESUMEN	
Esta nota de estudio presenta la versión final de la encuesta sobre Capacidad CNS de las Aeronaves que vuelan en las Américas y Atlántico Norte, La NE tiene como objetivo discutir una estrategia de como la encuesta podría soportar la implementación de algunas tecnologías CNS en la Región SAM.	
Referencias	
- Plan Mundial de Navegación Aérea (Doc. 9750)	
Objetivos Estratégicos de la OACI	<i>A – Seguridad Operacional B – Capacidad y Eficiencia de la Navegación Aérea</i>

1. Introducción

1.1 En la SAM/IG/21 fue presentada la versión preliminar de la encuesta CNS de aeronaves realizada por IATA en 2018.

1.2 El objetivo de la encuesta es la necesidad de que la implementación de las tecnologías CNS tenga en consideración la capacidad presente de la flota de aeronaves en el espacio aéreo en que se tenga la intención de utilizarla.

2. Discusión

2.1 Teniendo en cuenta la importancia de conocer la capacidad de la flota para dar soporte a los análisis de costo-beneficio que deben ser realizados previamente a las implementaciones CNS, IATA ha finalizado la encuesta para verificar dicha capacidad.

2.2 Hasta la fecha, 27 aerolíneas han suministrado información a la encuesta, totalizando 3.375 aeronaves en la base de datos. Las aerolíneas son las siguientes:

- a) AEROLITORAL
- b) AEROMEXICO
- c) AEROMEXICO CONNECT
- d) AIR CANADA
- e) AIR CANADA ROUGE
- f) AIR NEW ZEALAND
- g) AIR EUROPA
- h) AVIANCA BRAZIL
- i) AZUL
- j) CONDOR
- k) COPA AIRLINES
- l) DELTA
- m) ETIHAD
- n) FEDEX
- o) GOL
- p) IBERIA
- q) JETBLUE
- r) KLM
- s) LATAM
- t) LIAT
- u) QATAR AIRWAYS
- v) ROYAL JORDANIAN
- w) SAS
- x) SWISS
- y) SWISS GLOBAL
- z) UNITED AIRLINES
- aa) UPS

2.3 Las flotas investigadas fueron las siguientes:

- a) A306
- b) A310
- c) A319
- d) A320
- e) A321
- f) A330
- g) A332
- h) A333
- i) A343
- j) A346
- k) A359
- l) A388
- m) ATR42
- n) ATR72
- o) B737
- p) B738
- q) B739
- r) B744

- s) B757
- t) B752
- u) B763
- v) B767
- w) B772
- x) B777
- y) B77F
- z) B77L
- aa) B77W
- bb) B787
- cc) B788
- dd) B789
- ee) DC10
- ff) E170
- gg) E190
- hh) MD11
- ii) MD88
- jj) MD90

2.4 Las principales tecnologías CNS consideradas en la encuesta fueron las siguientes:

2.4.1 Comunicaciones

- a) AeroMAX / WiMAX - or any form of gate link communications
- b) 8.33kHz VHF Transceivers
- c) HF Transceivers
- d) High Frequency Data Link (HFDL)
- e) ACARS
- f) CPDLC based on ATN/VDL Mode 2
- g) CPDLC based on FANS 1/A or newer FANS standard
- h) Cockpit SatCom voice based on INMARSAT
- i) Cockpit SatCom data based on INMARSAT
- j) Cockpit SatCom voice based on IRIDIUM
- k) Cockpit SatCom data based on IRIDIUM
- l) Emergency Locator Transmitter(s) – ELTs

2.4.2 Navegación

- a) Multi Mode Receivers - MMRs
- b) System (SBAS)/WAAS, EGNOS etc.
- c) GNSS Receivers:
 - TSO-C129a
 - TSO-C145c
 - TSO-C146c
 - TSO-C196
 - RAIM
 - AAIM
 - FDE
- d) RNAV 10 (RNP 10)
- e) RNAV 5 / B-RNAV

- f) RNAV 2
- g) RNAV 1
- h) RNP 4
- i) RNP 2
- j) RNP 1 / P-RNAV
- k) RNP 0.3
- l) RNP <0.3
- m) RNP APCH
- n) Advanced RNP
- o) APV Baro VNAV
- p) LPV SBAS
- q) INS / IRU
- r) FMS RTA
- s) FMS RF
- t) FMS FRT

2.4.3 Vigilancia

- a) Mode S
- b) Mode S - ELS
- c) Mode S - EHS
- d) ADS-B OUT based on DO-260
- e) ADS-B OUT based on DO-260A
- f) ADS-B OUT based on DO-260B or later
- g) ADS-B IN displayed on a cockpit integrated EFB
- h) ADS-B IN displayed on cockpit Primary Flight Display(s)
- i) ADS-B IN displayed on a cockpit stand alone device, e.g. iPad
- j) ADS-C
- k) FMS WPR

2.5 Las informaciones actualizadas sobre capacidad de Comunicaciones, Navegación y Vigilancia, por FIR, se adjunta, respectivamente, como **Apéndice A, B y C** a esta nota de estudio. Esas informaciones deben ser consideradas teniendo en cuenta que la base de datos **no** contiene todas las aeronaves que operan en el espacio aéreo, sino **solamente** de las aeronaves de las aerolíneas que han suministrado datos hasta la fecha.

2.6 La encuesta podría ser complementada por informaciones de la Aviación General, Ejecutiva y Militar, caso los Estados y/o Oficina Regional SAM soliciten que estos operadores de aeronaves también llenen el formulario correspondiente. Los Estados interesados podrían coordinar con estos usuarios el llenado de la encuesta por medio del siguiente link:

https://docs.google.com/forms/d/e/1FAIpQLSdqIUDhD8rfufXrDpIv_5T8wt-ryGmW798HhCTIxTUZ-Y9AWA/viewform.

2.7 IATA podría proveer la información para la Oficina Regional SAM y/o para cada Estado interesado en recibir los resultados de la encuesta para cada FIR o para la Región SAM.

3. **Acciones sugeridas**

Se invita a la reunión a:

- a) Tomar nota de la información contenida en esta nota de estudio;
- b) Considerar la información actualizada sobre capacidad CNS de la flota en los proyectos de implementación CNS Regionales y Nacionales;
- c) Evaluar la factibilidad de establecer una estrategia para que los operadores de la aviación general, ejecutiva y militar suministren datos sobre la capacidad de sus flotas.

Based on a survey of 3,375 airframes

Categorized by Flight Information Region (FIR)



IATA Americas Region COMMUNICATIONS

Replacing assumptions with facts

This report is based on unedited airspace user submissions

Refer to statistical note on page 2

CONTRIBUTING AIRSPACE USERS

AEROMEXICO, AEROMEXICO CONNECT, AEROLITORAL, AIR CANADA, AIR CANADA ROUGE, AIR NEW ZEALAND, AIR EUROPA, AVIANCA BRAZIL, AZUL, CONDOR, COPA, DELTA, ETIHAD, FEDEX, GOL, IBERIA, JETBLUE, KLM, LATAM AIRLINES, LIAT, QATAR AIRWAYS, ROYAL JORDANIAN, SAS, SWISS, SWISS GLOBAL, UNITED, UPS.

AIRFRAME TYPES

A306, A310, A319, A320, A321, A330, A332, A333, A343, A346, A359, A388, ATR42, ATR72, B737, B738, B739, B744, B757, B752, B763, B767, B772, B777, B77F, B77L, B77W, B787, B788, B789, DC10, E170, E190, MD11, MD88, MD90.

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Data compilation date: 16th September 2018

Statistical Note

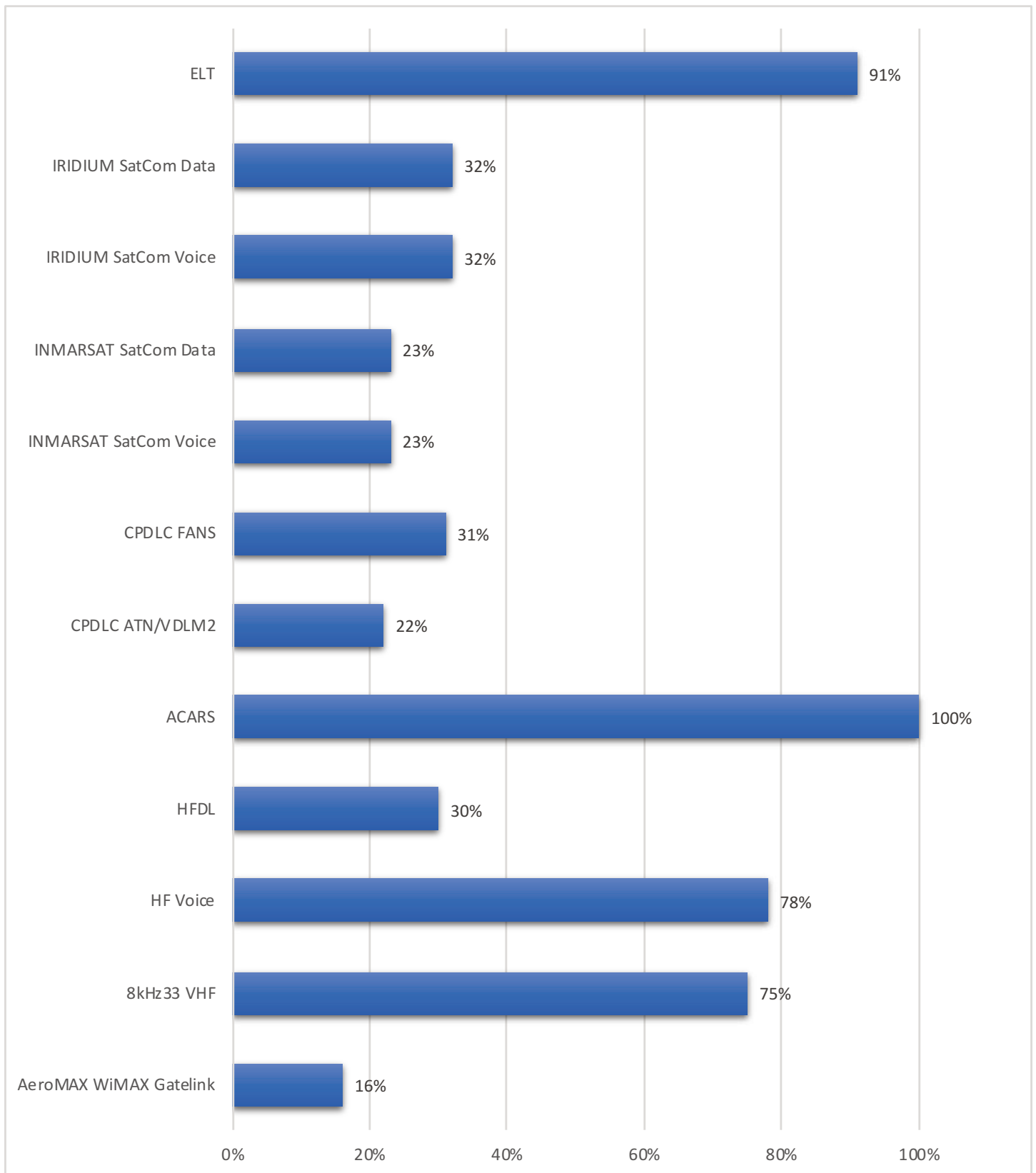
This document contains unedited airspace user data reflecting airframe COMMUNICATIONS equipage as reported by operators. The data is derived from a survey, not filed flight plans. It should be borne in mind that 70% of flight plans filed in the IATA Americas Region reflect actual airframe equipage. The remainder are generic or repetitive flight plans based on a standard fleet airframe. The results presented here are based solely on airspace user survey data.

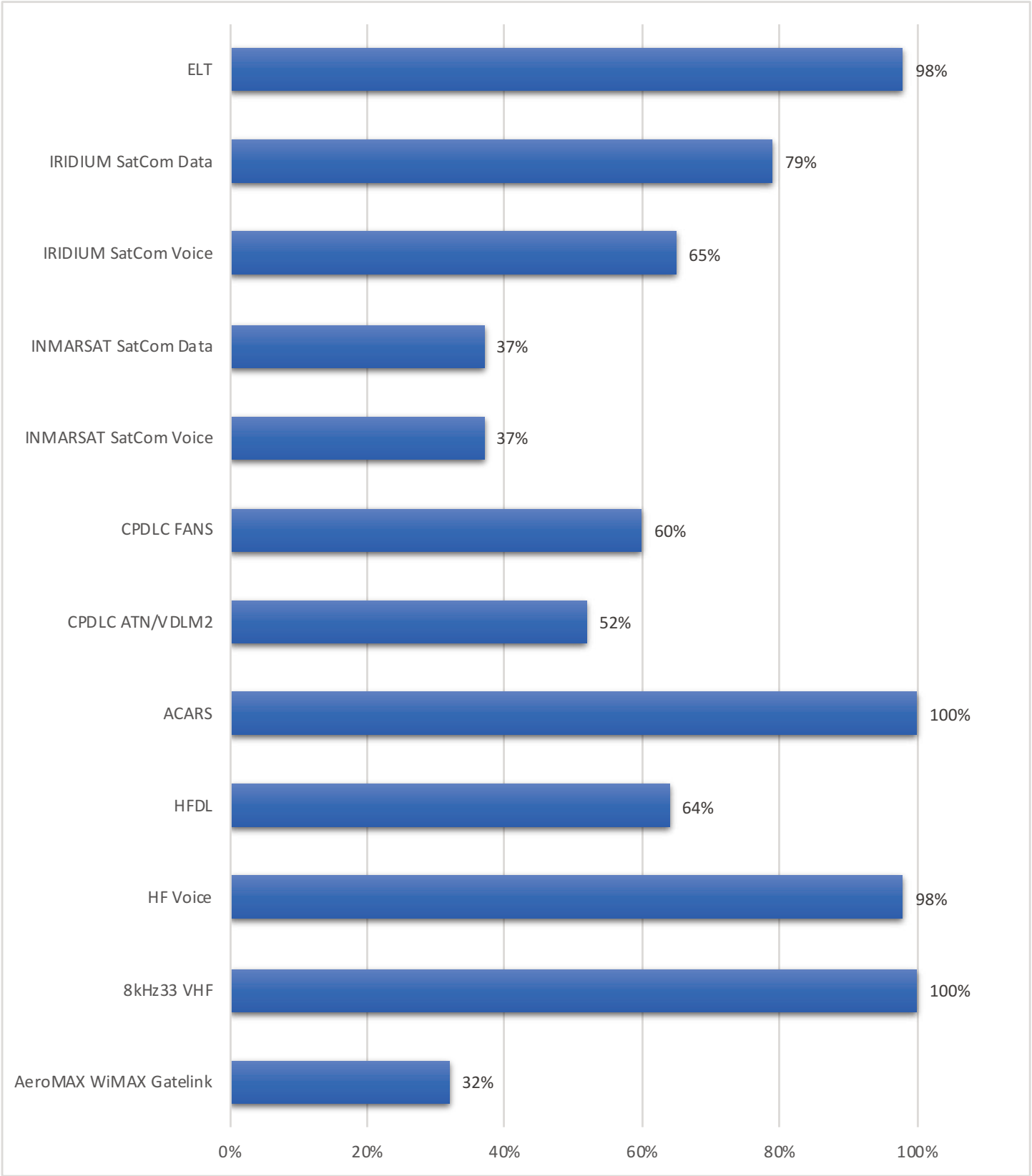
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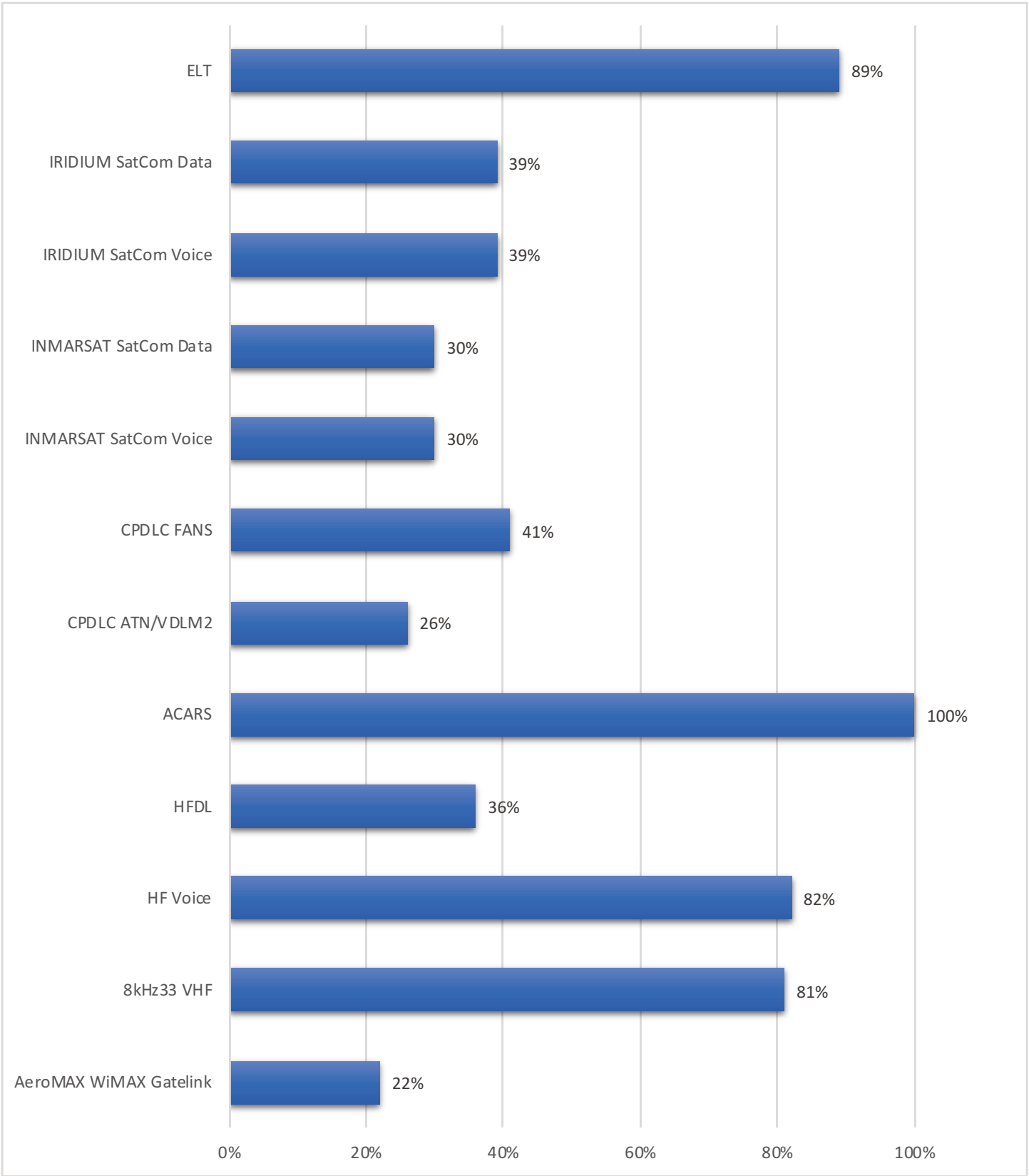
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Miami, Florida 33126
USA**

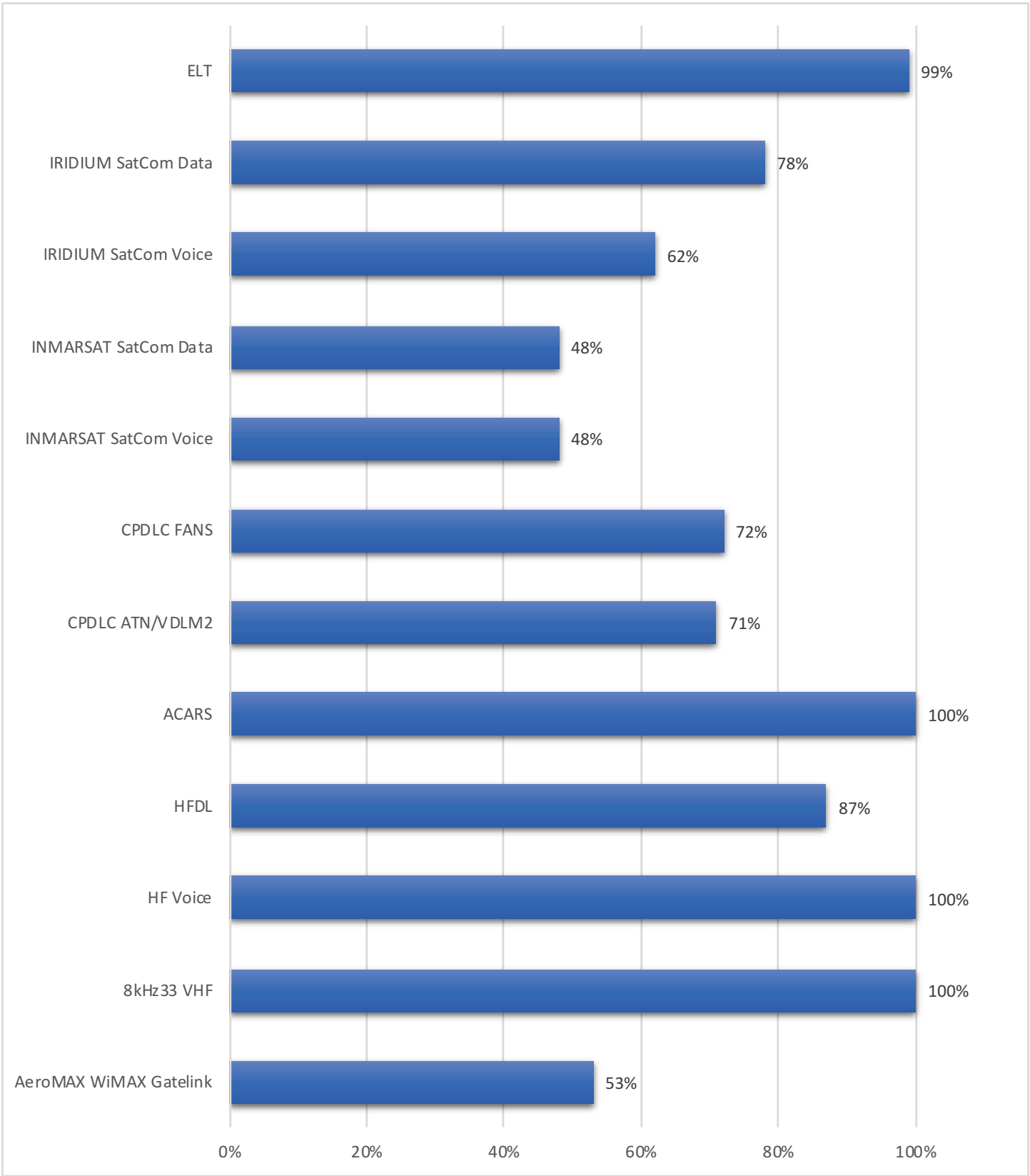
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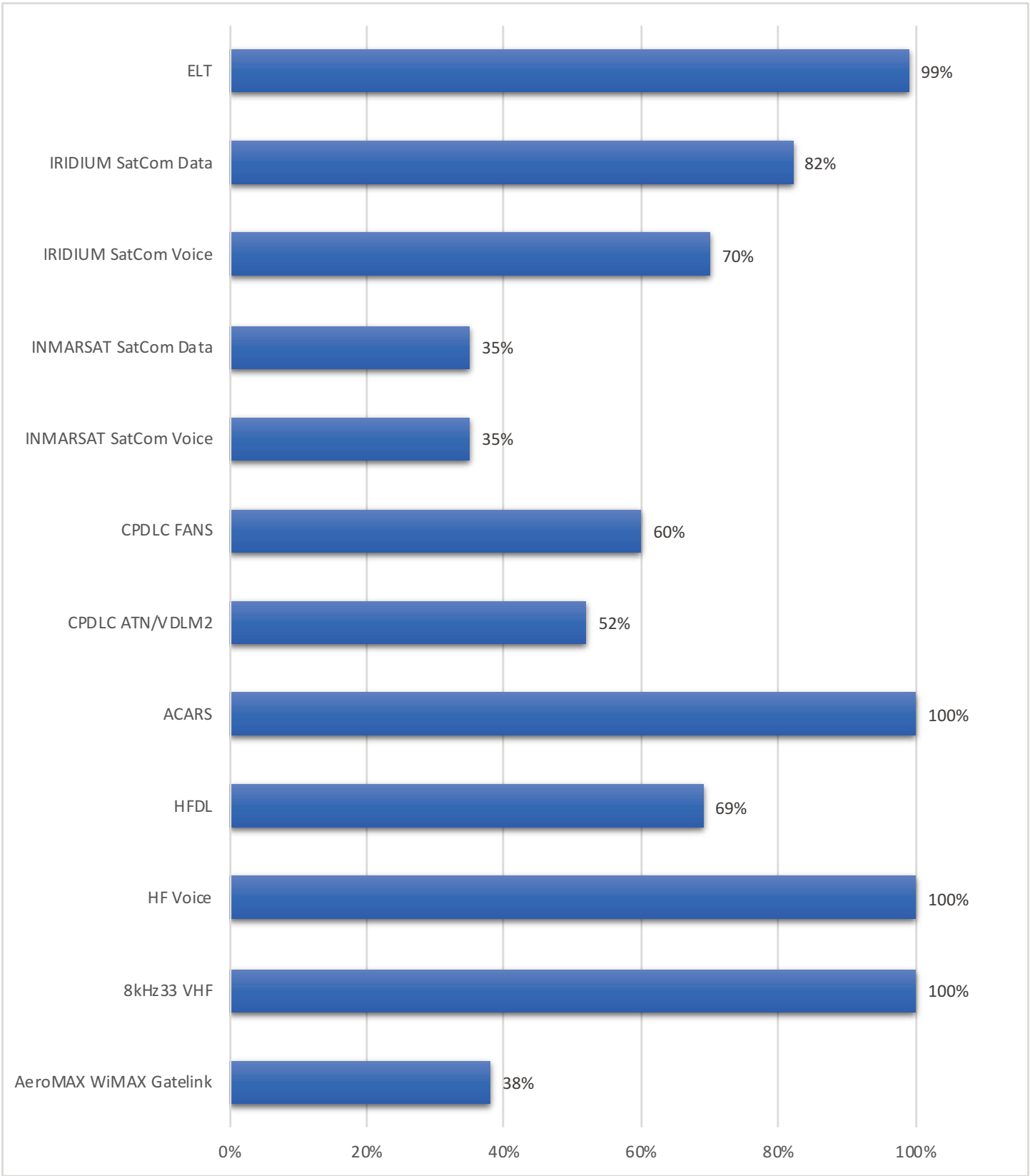
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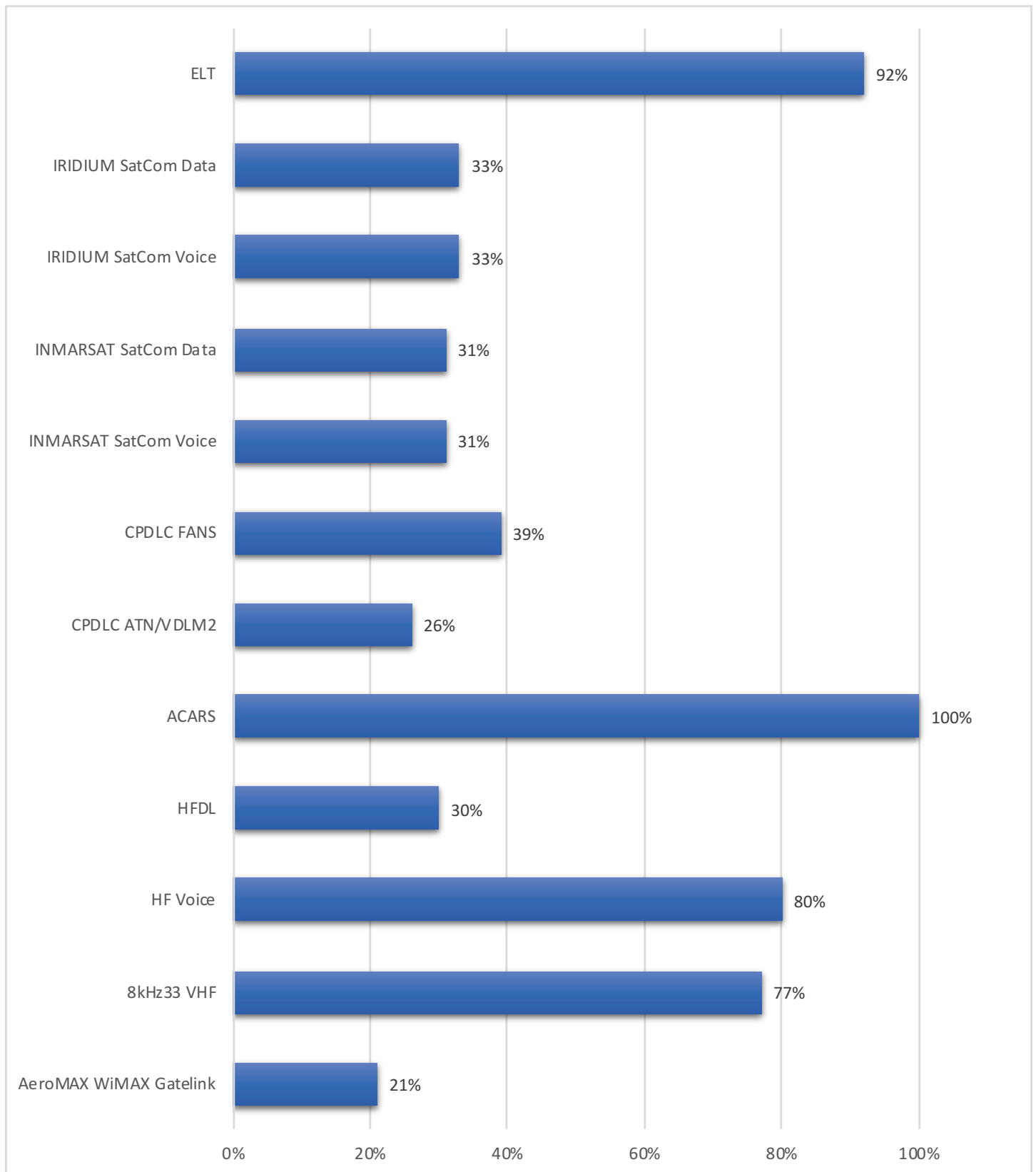




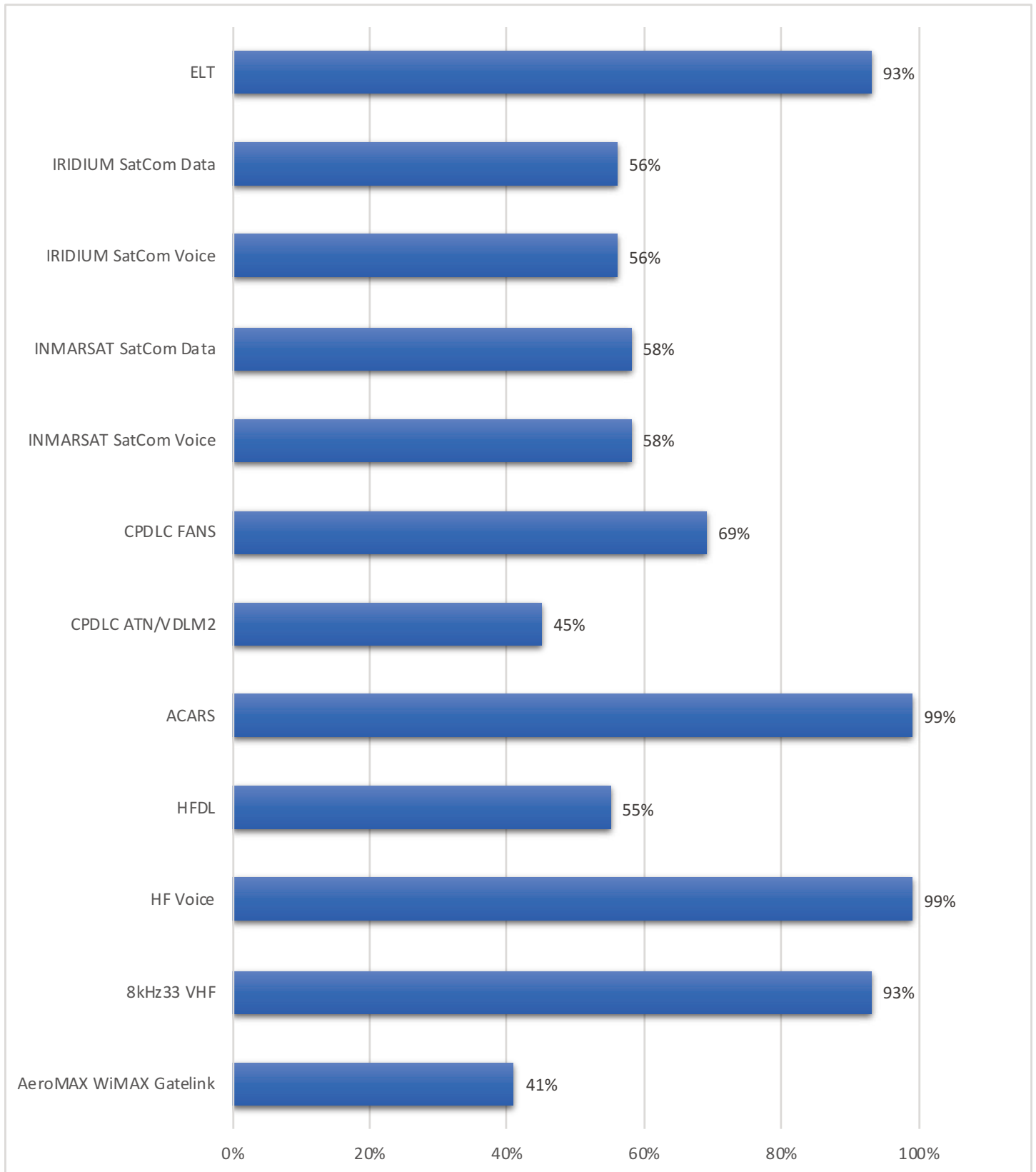


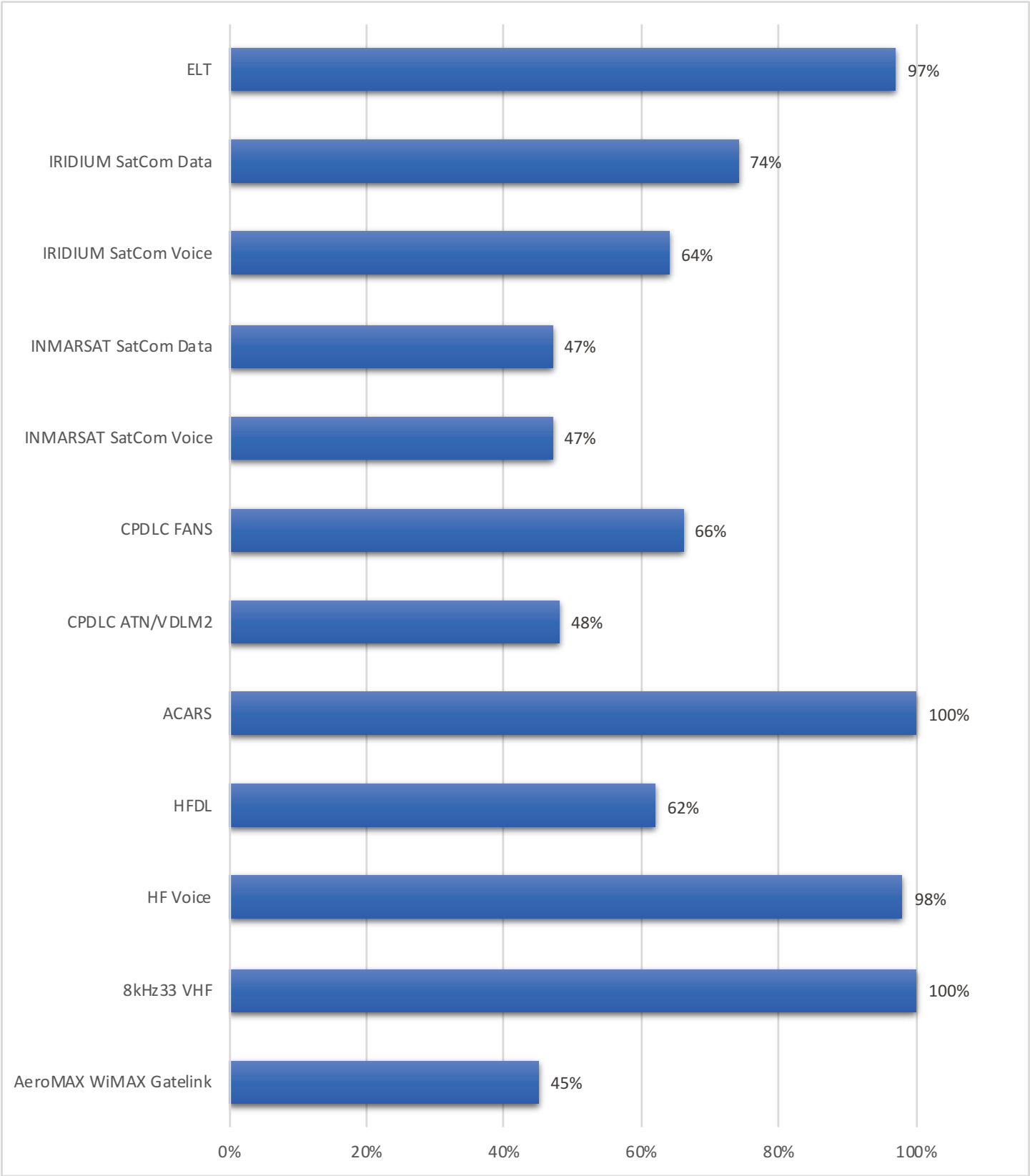


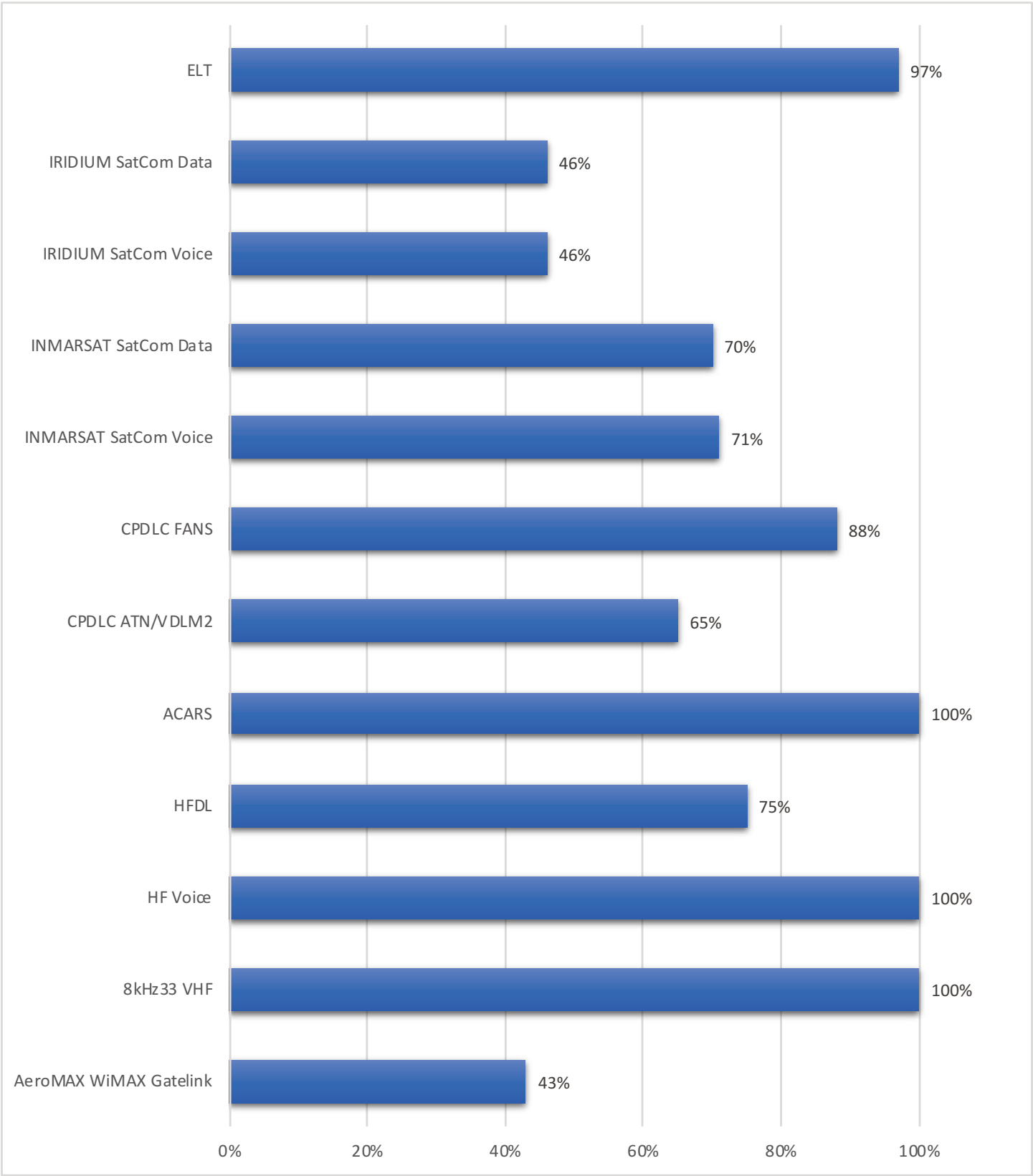


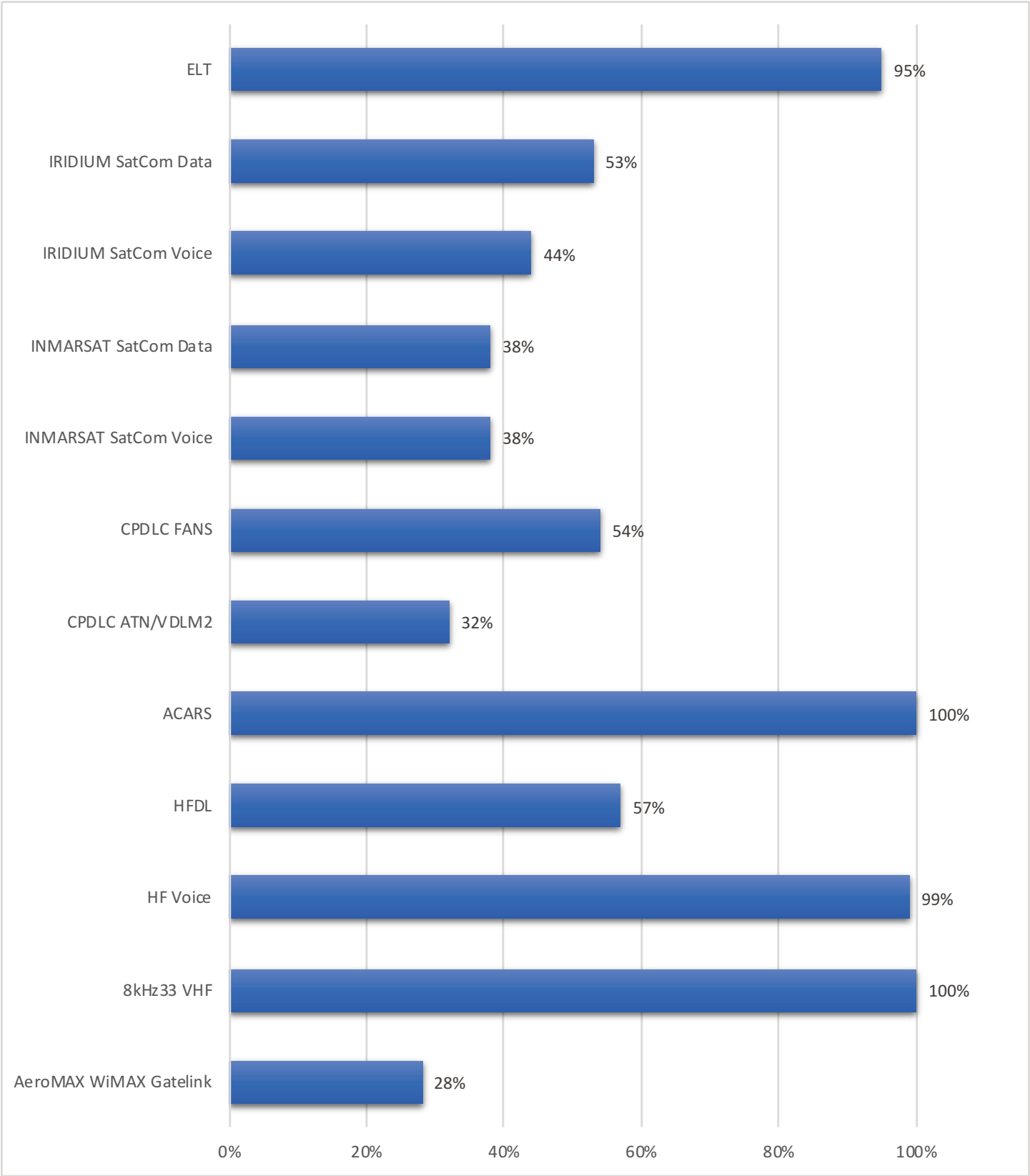


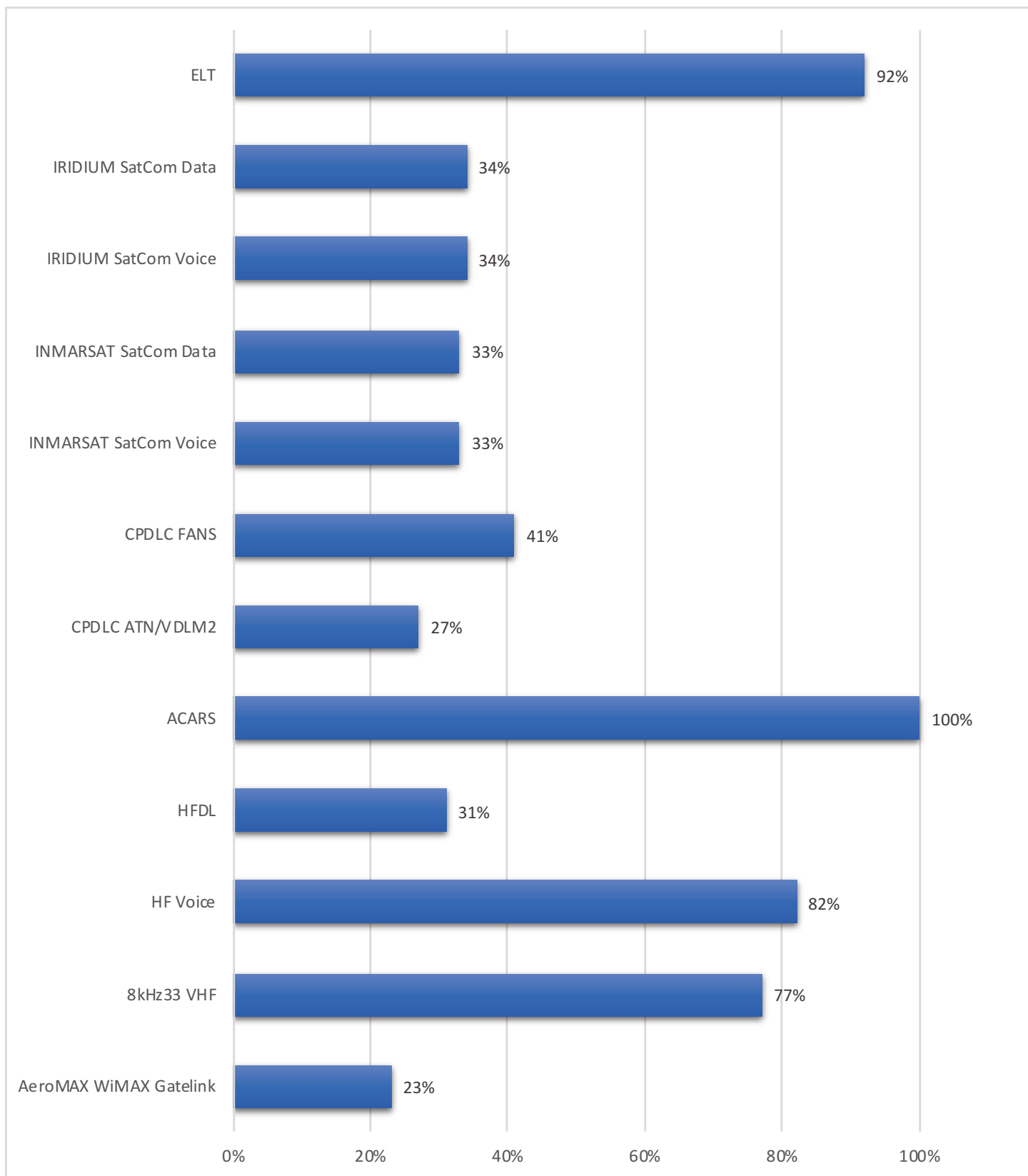
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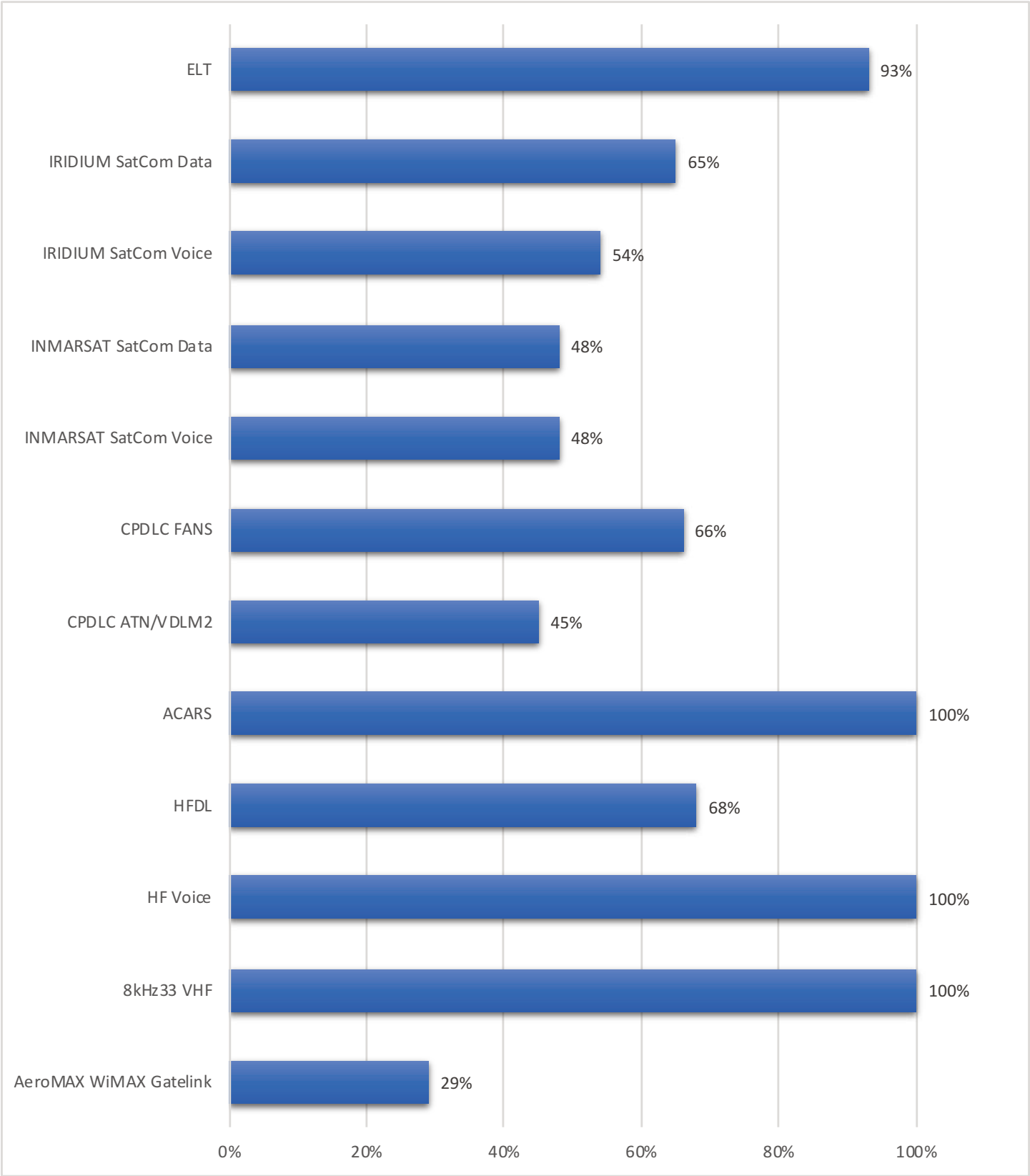




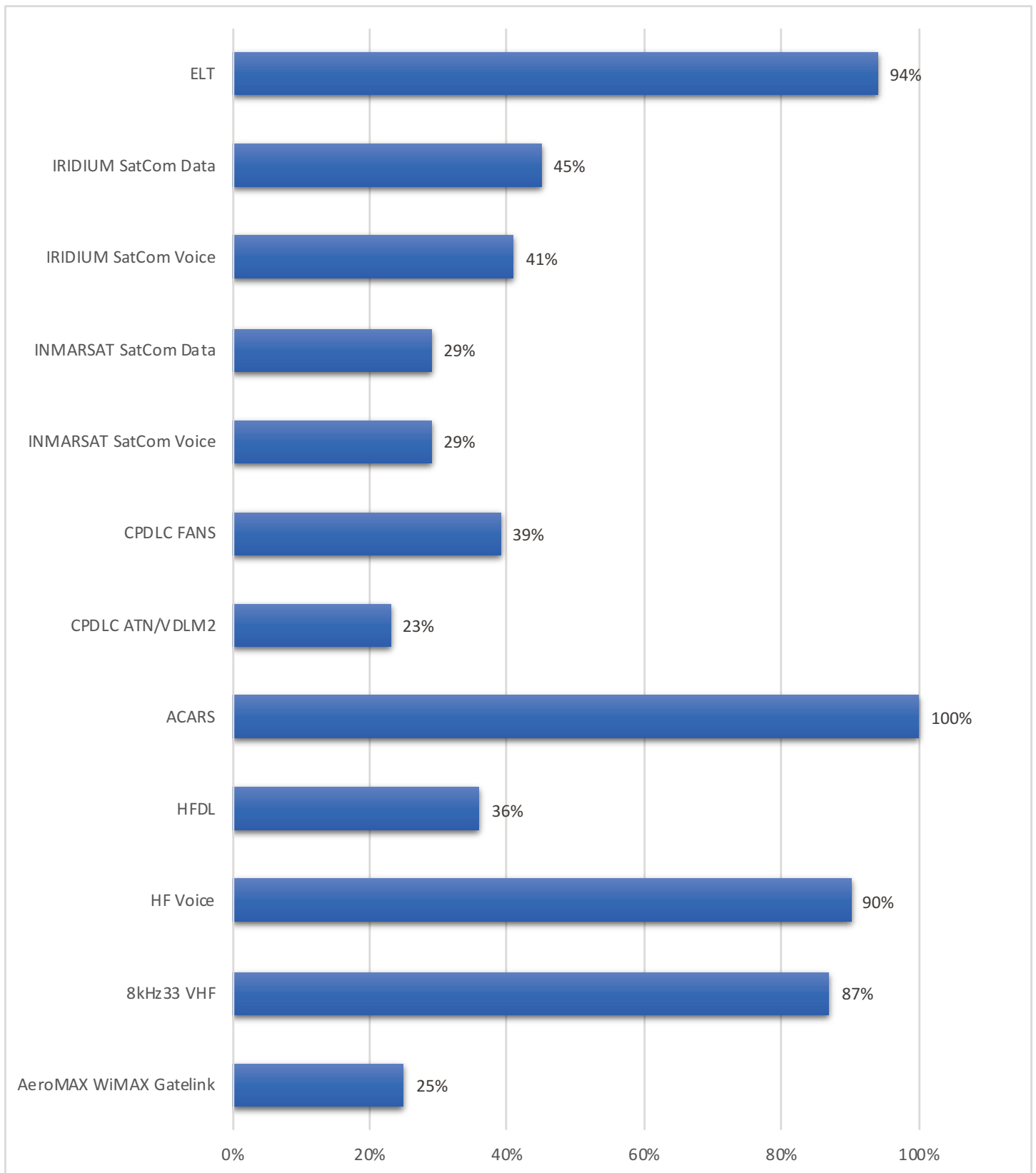


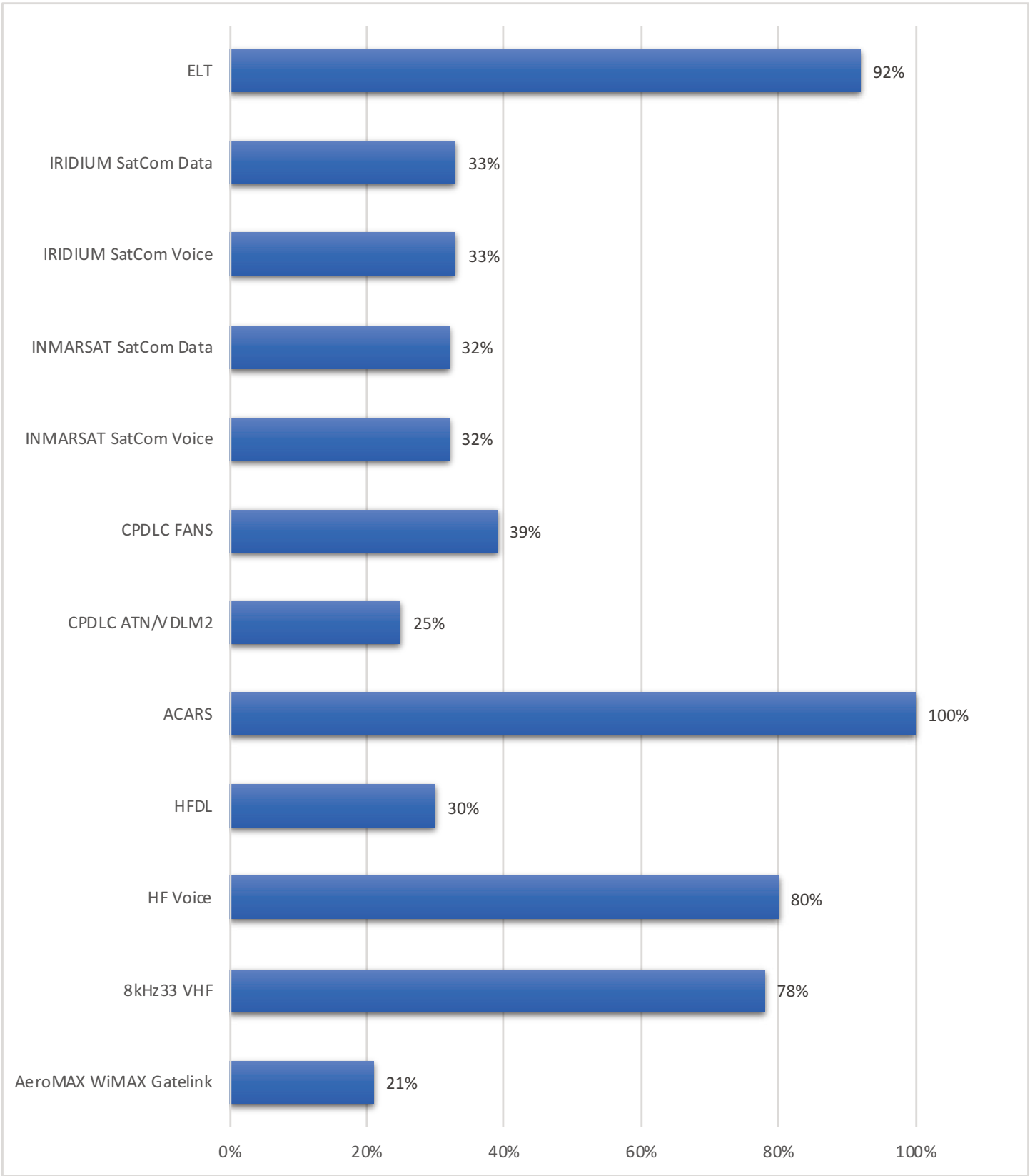


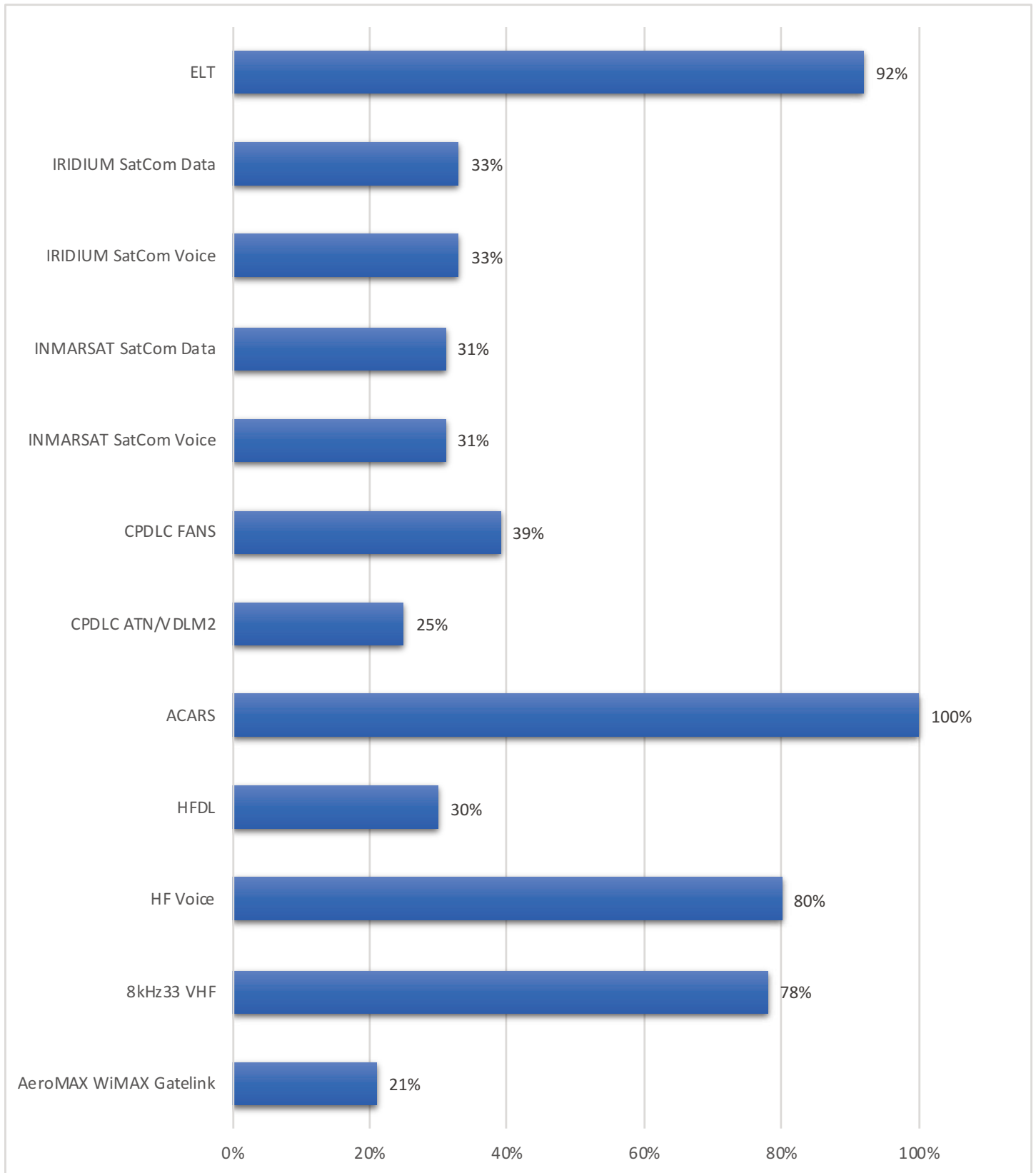




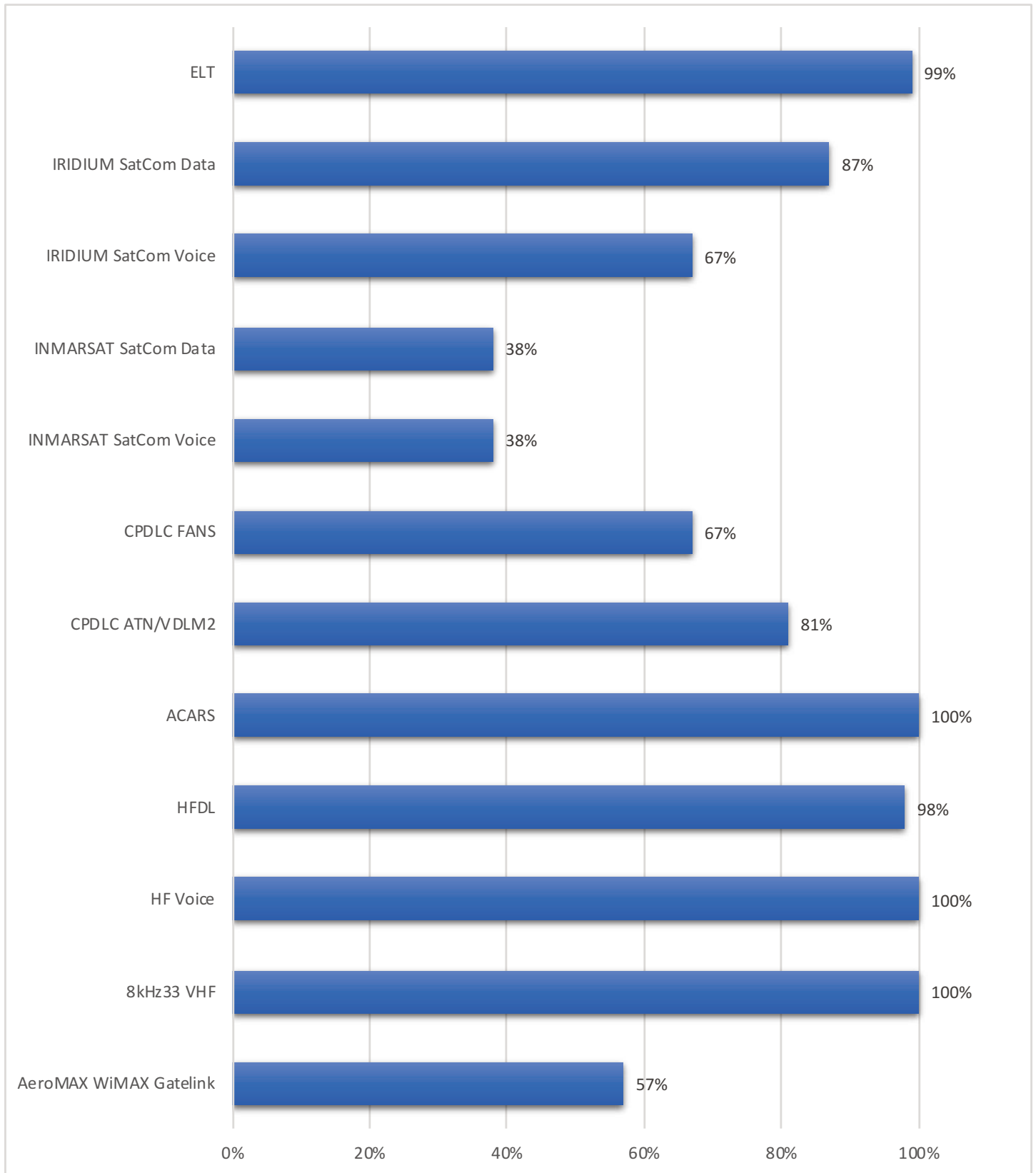
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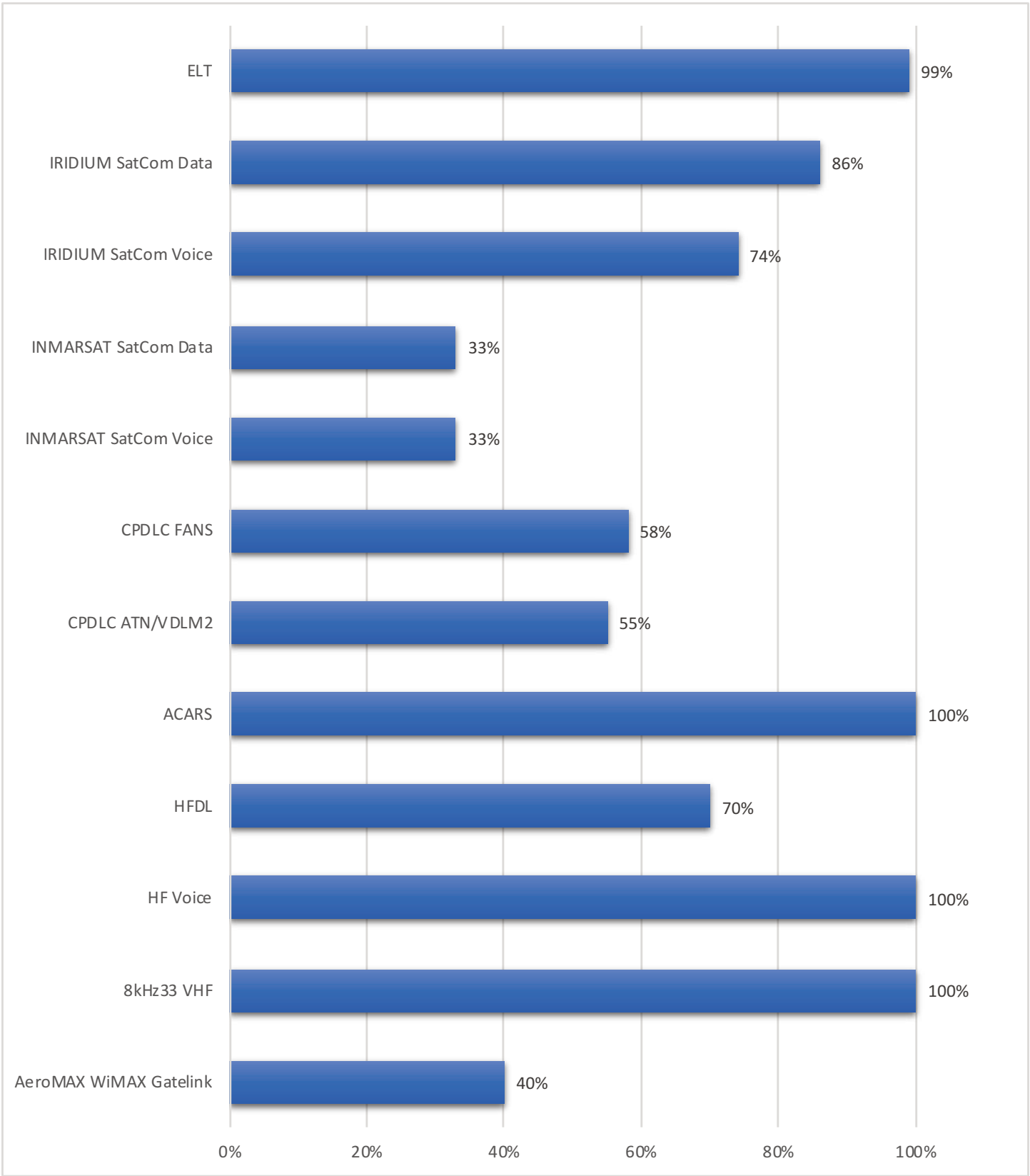


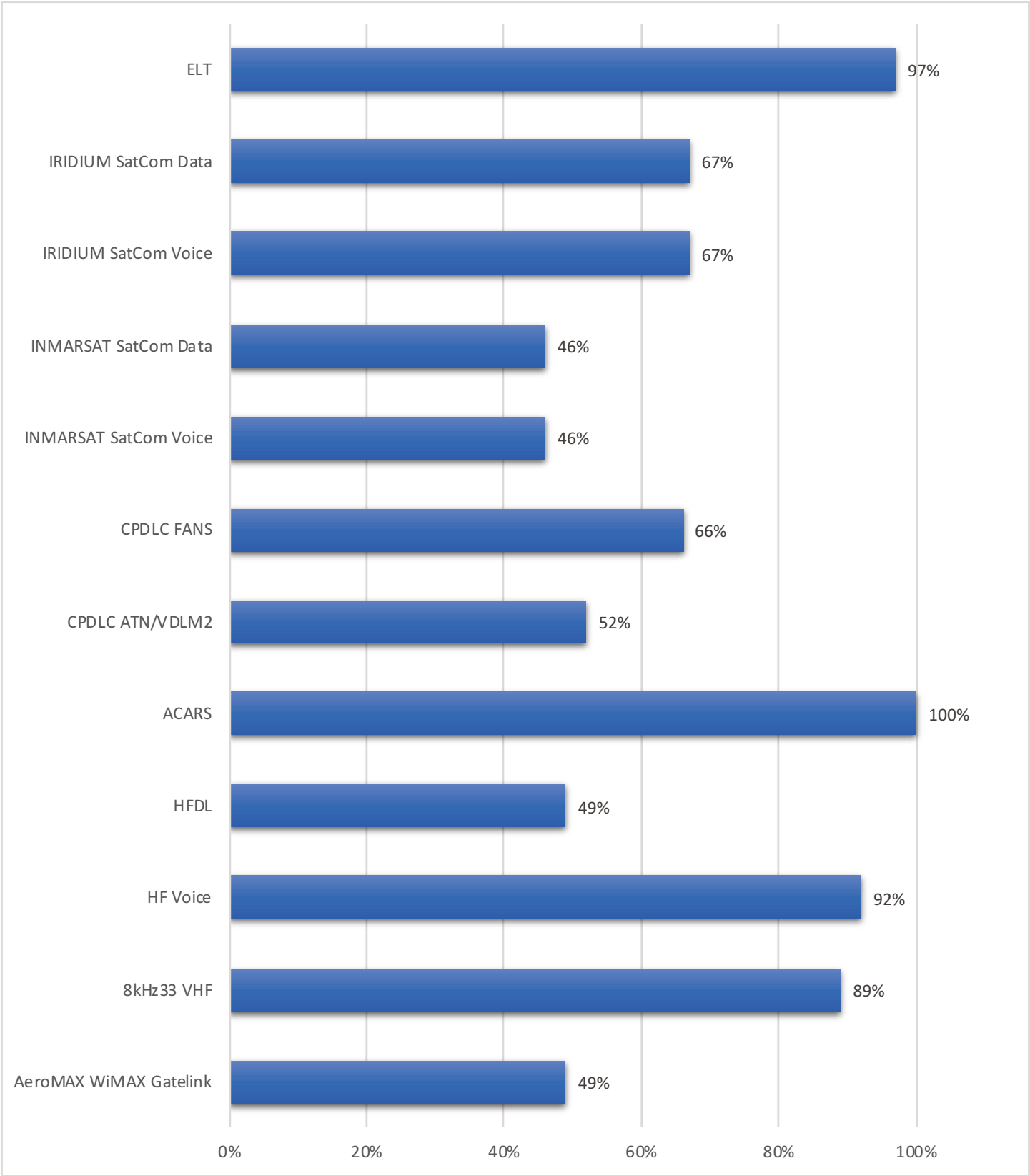


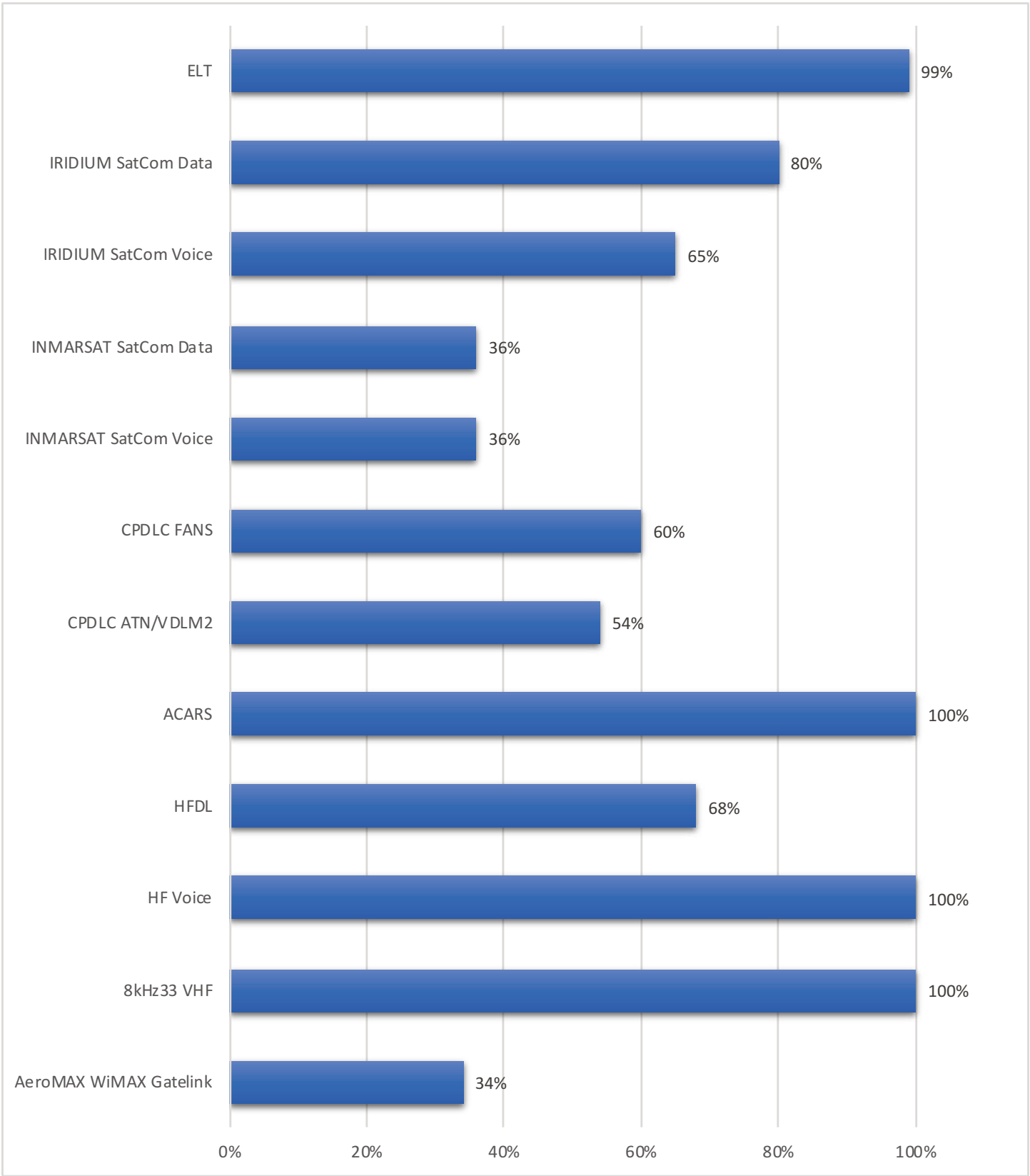


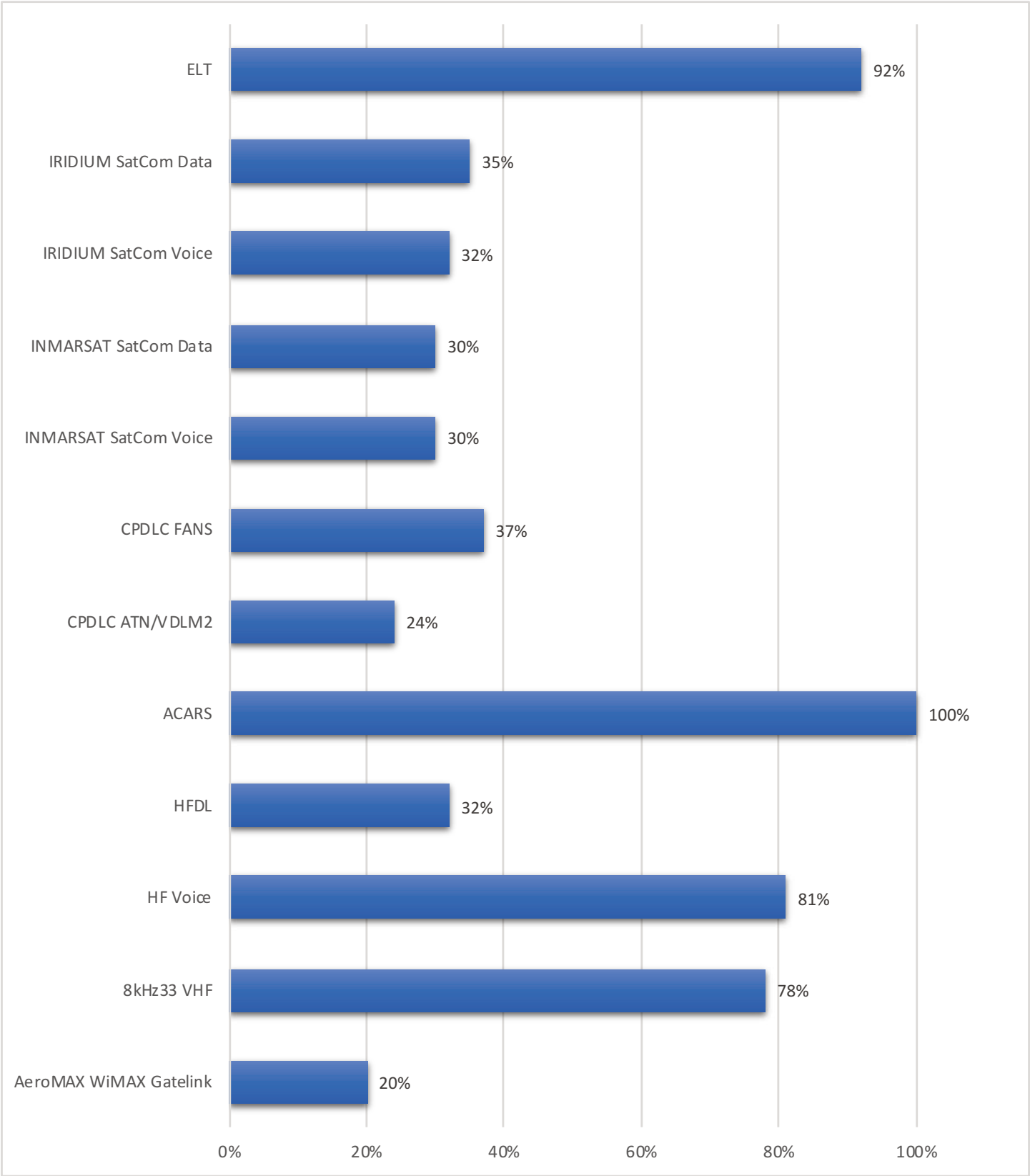
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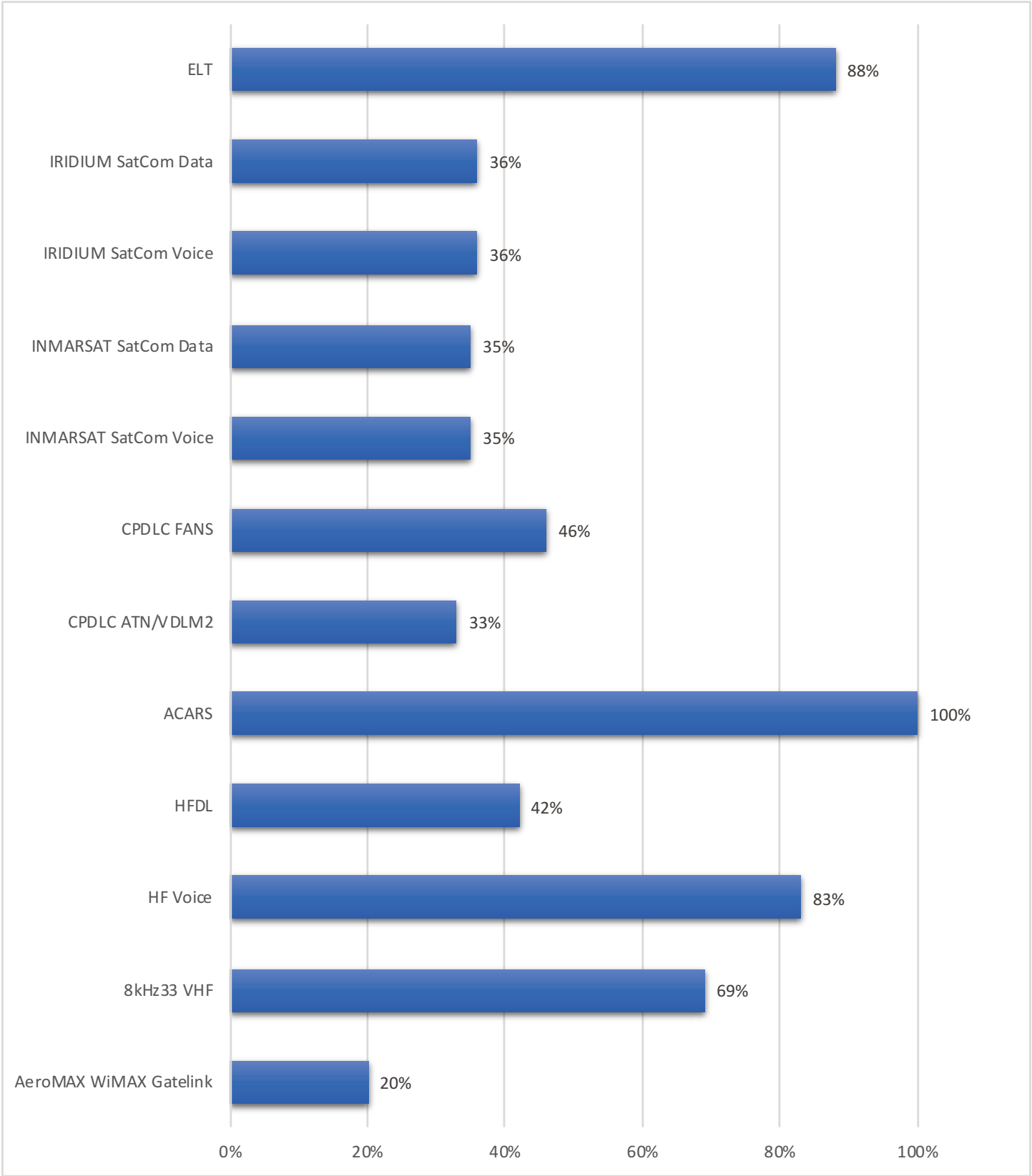


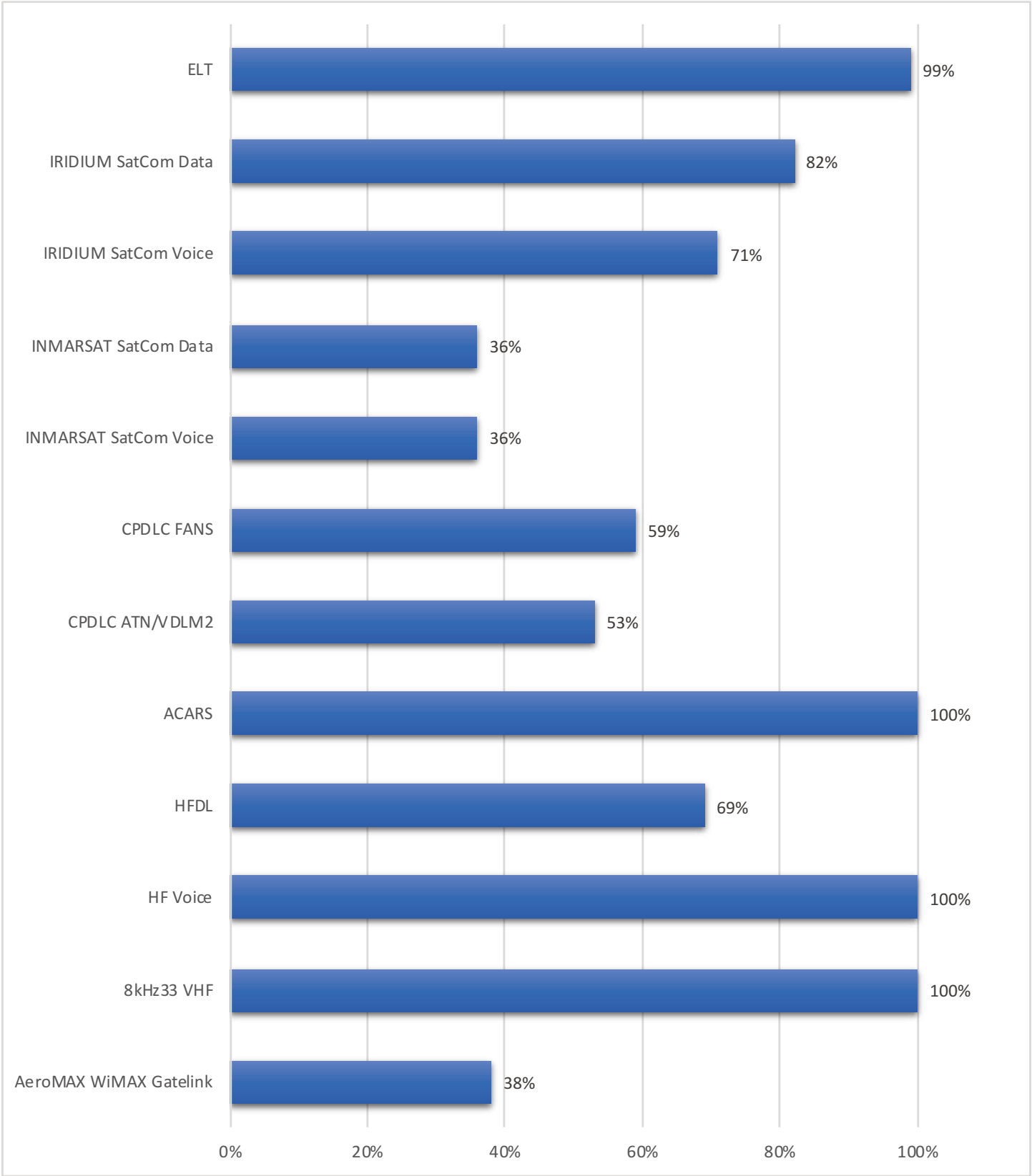




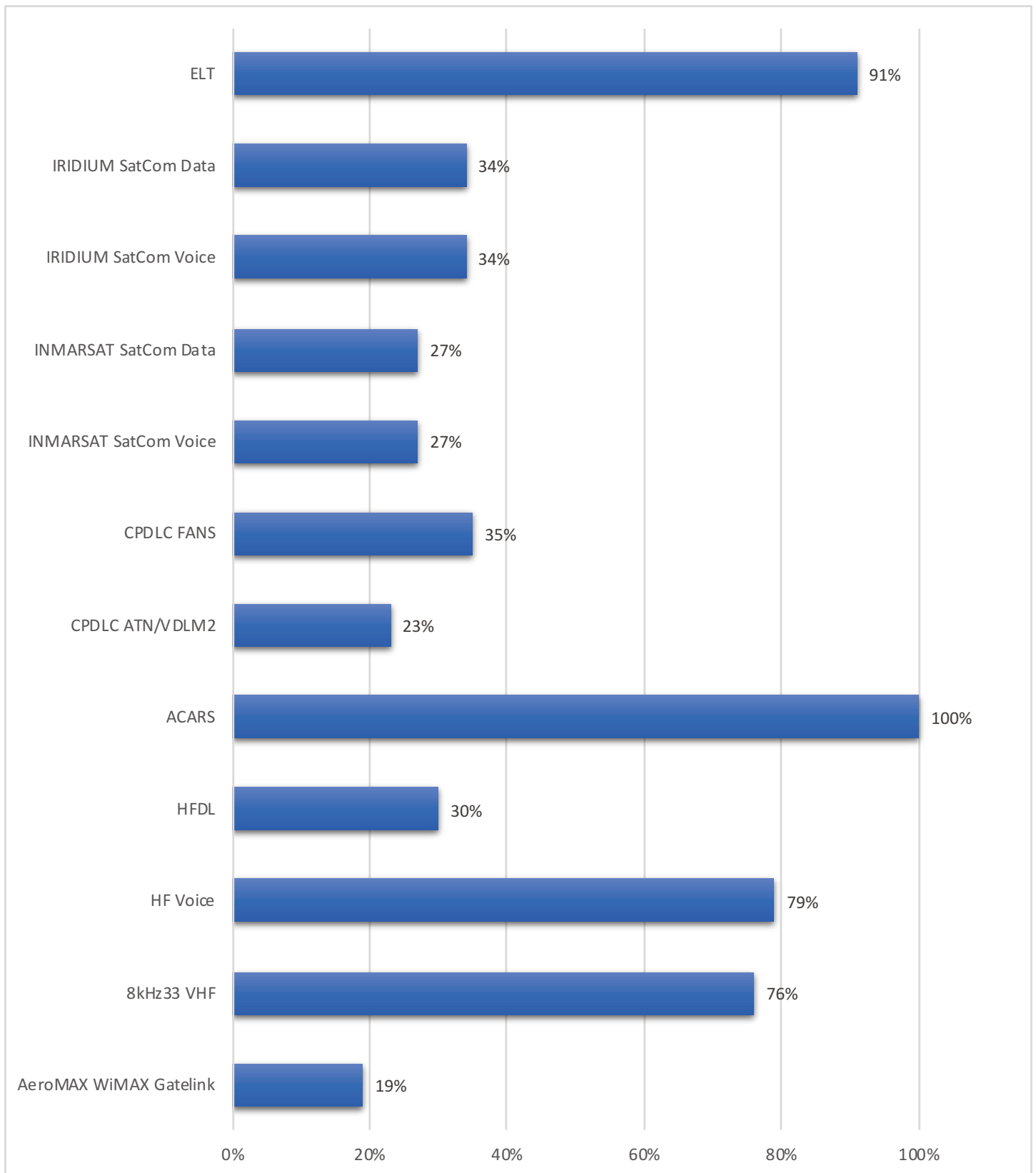




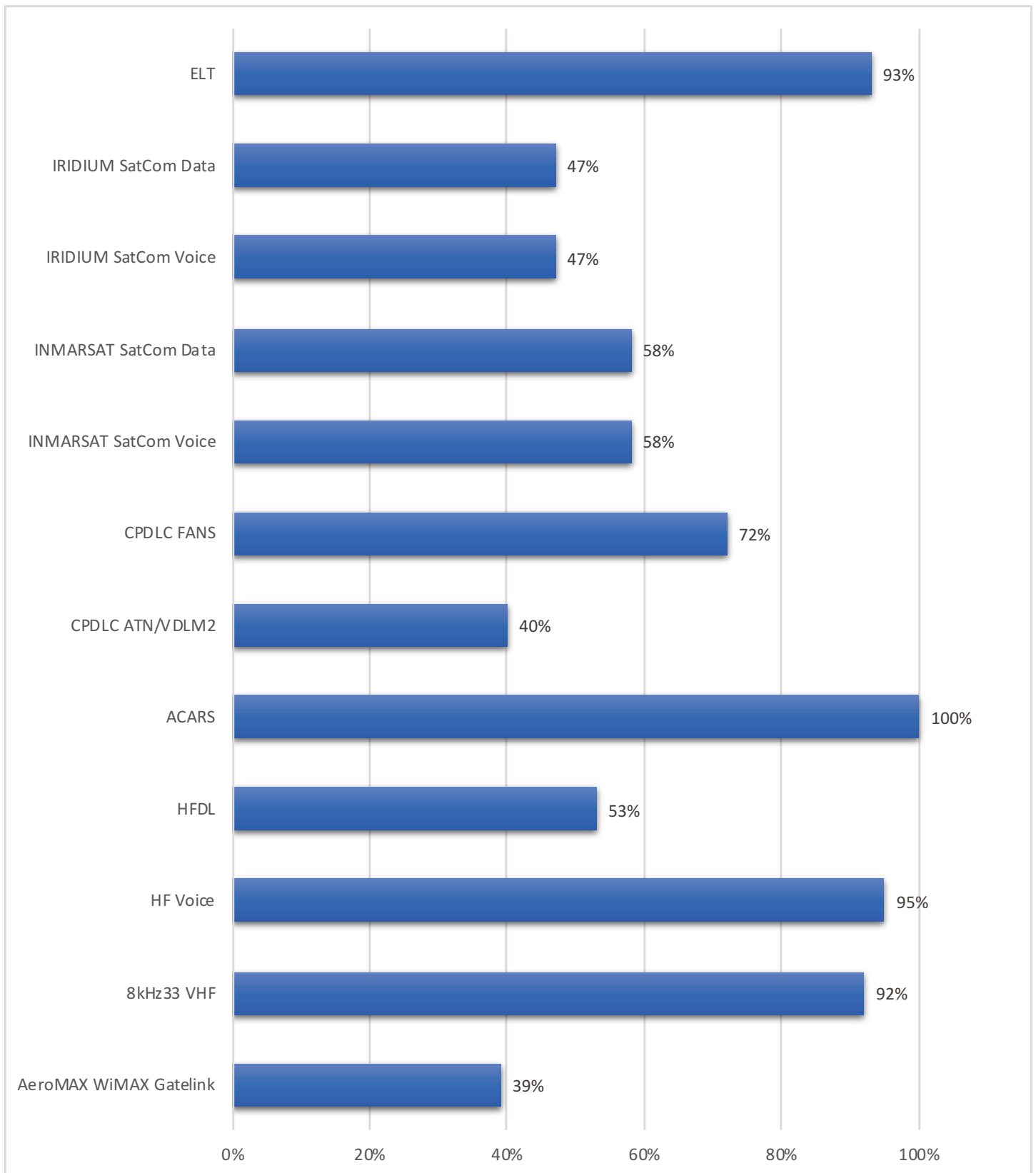


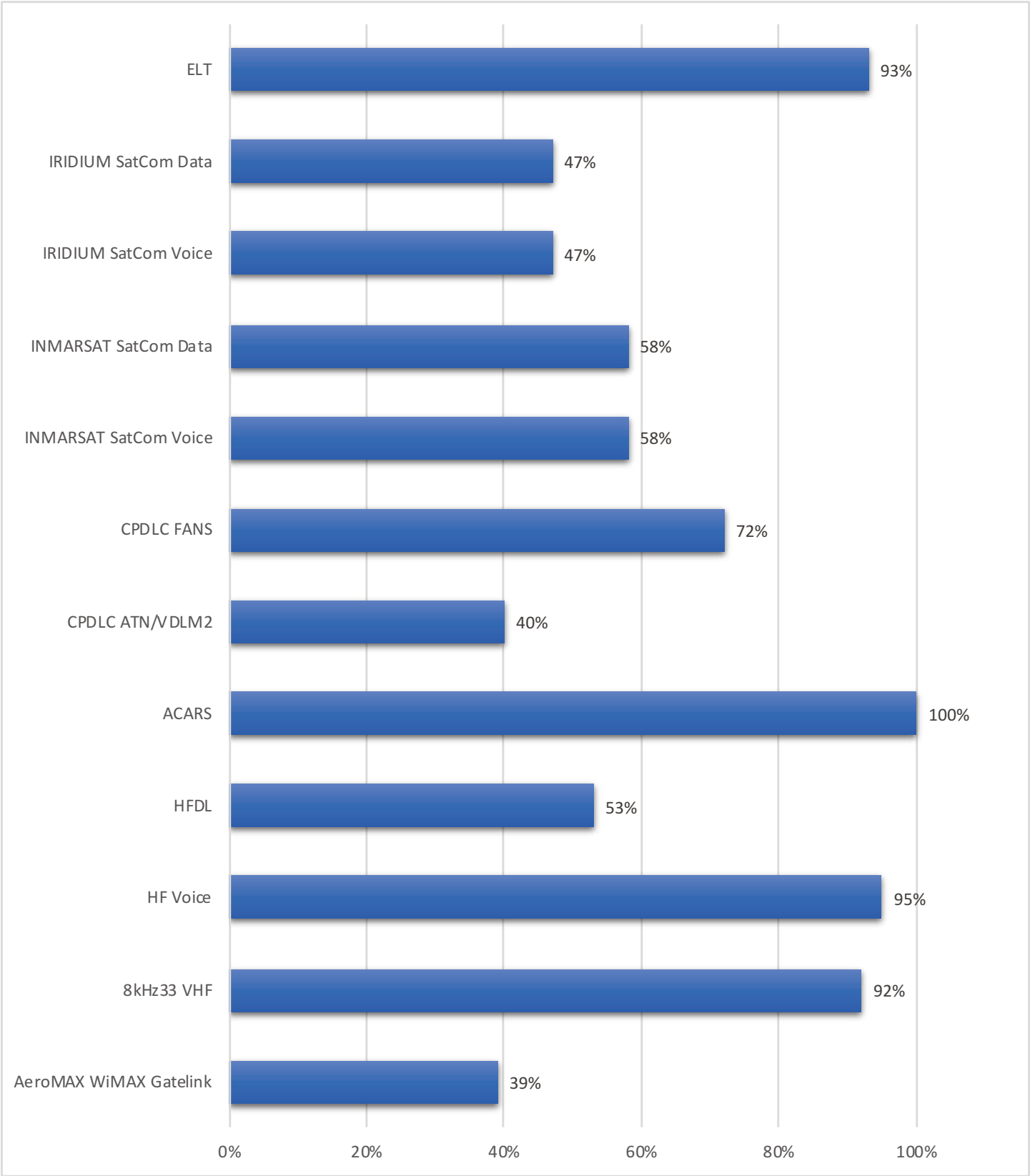


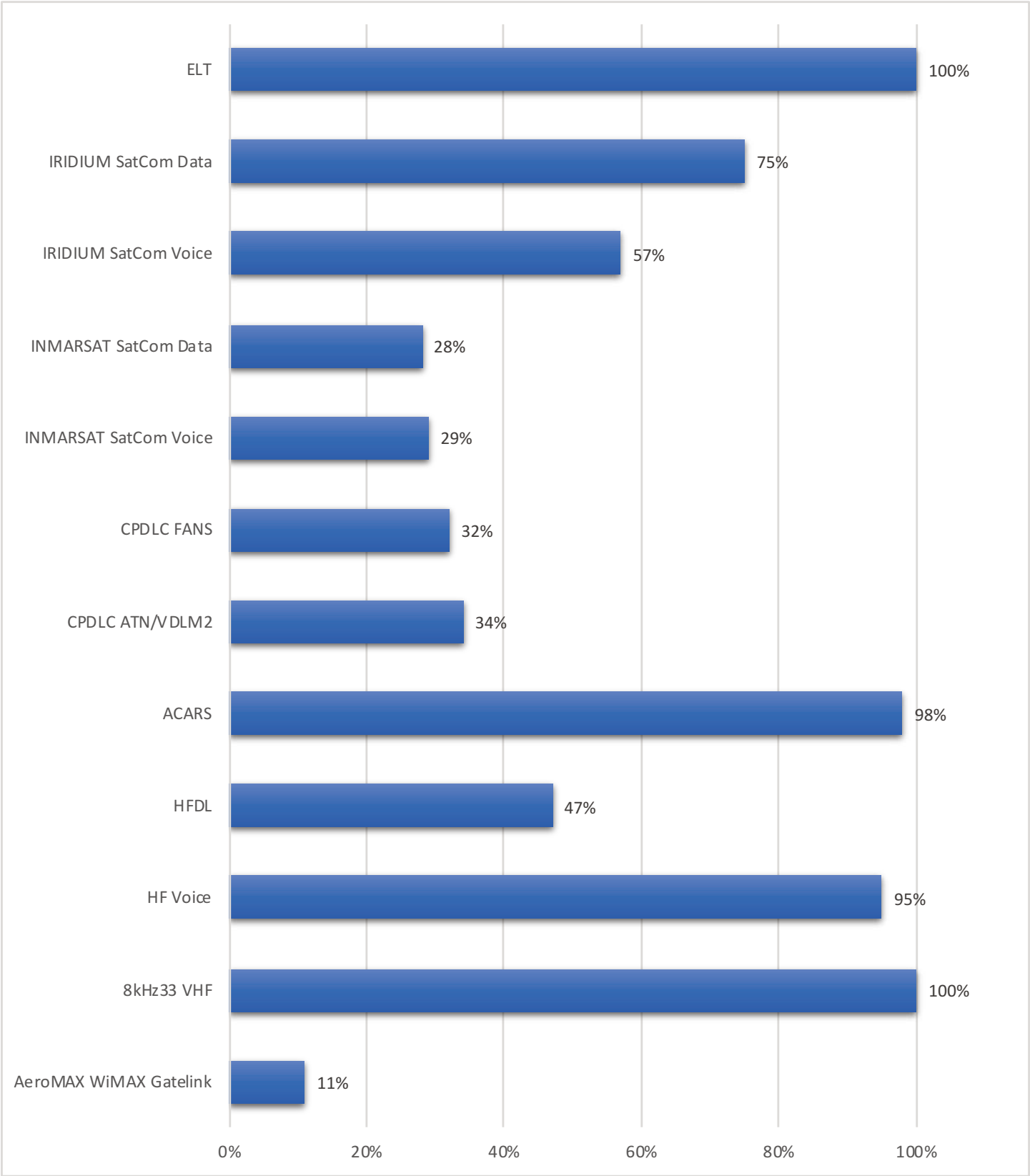
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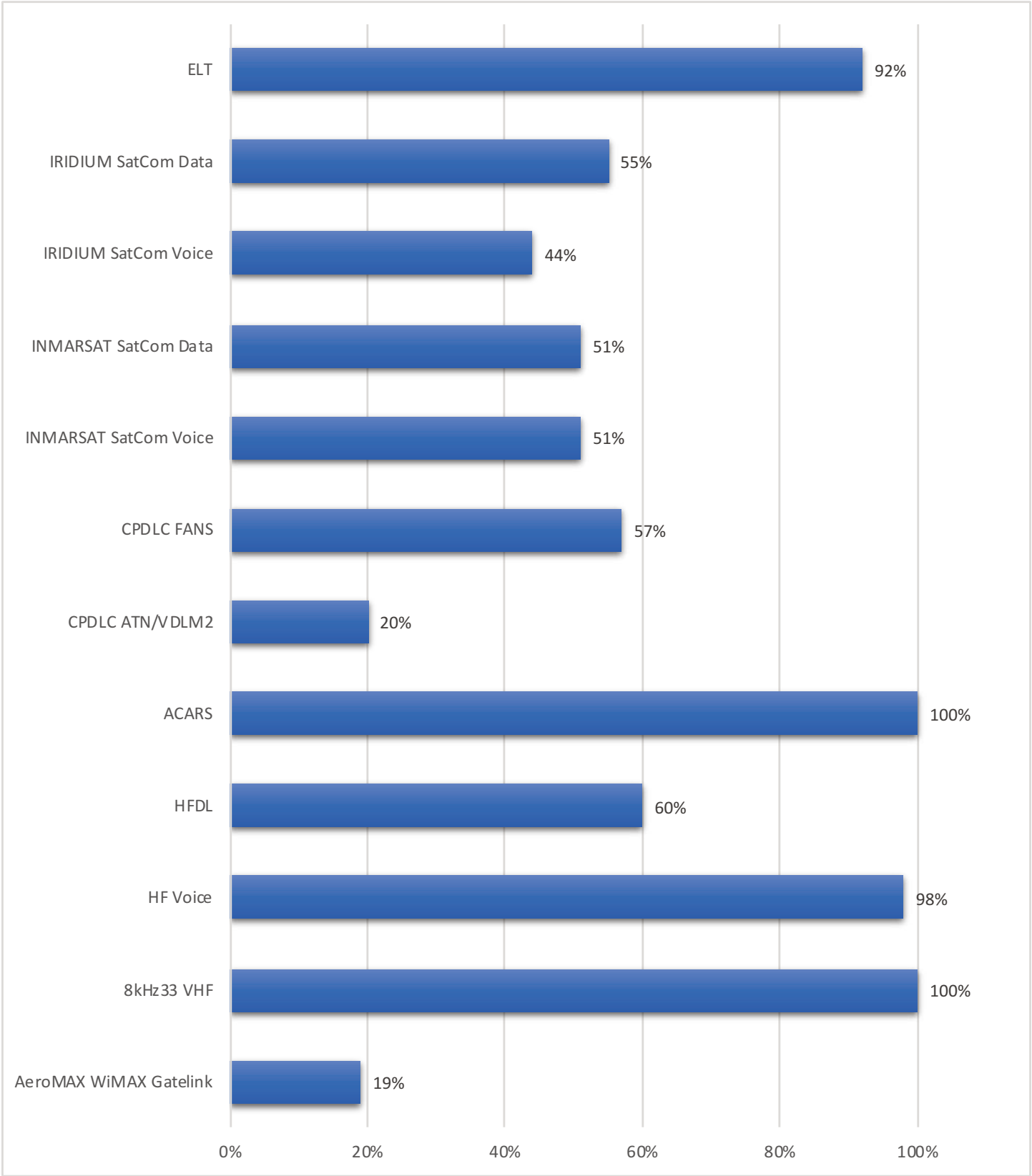


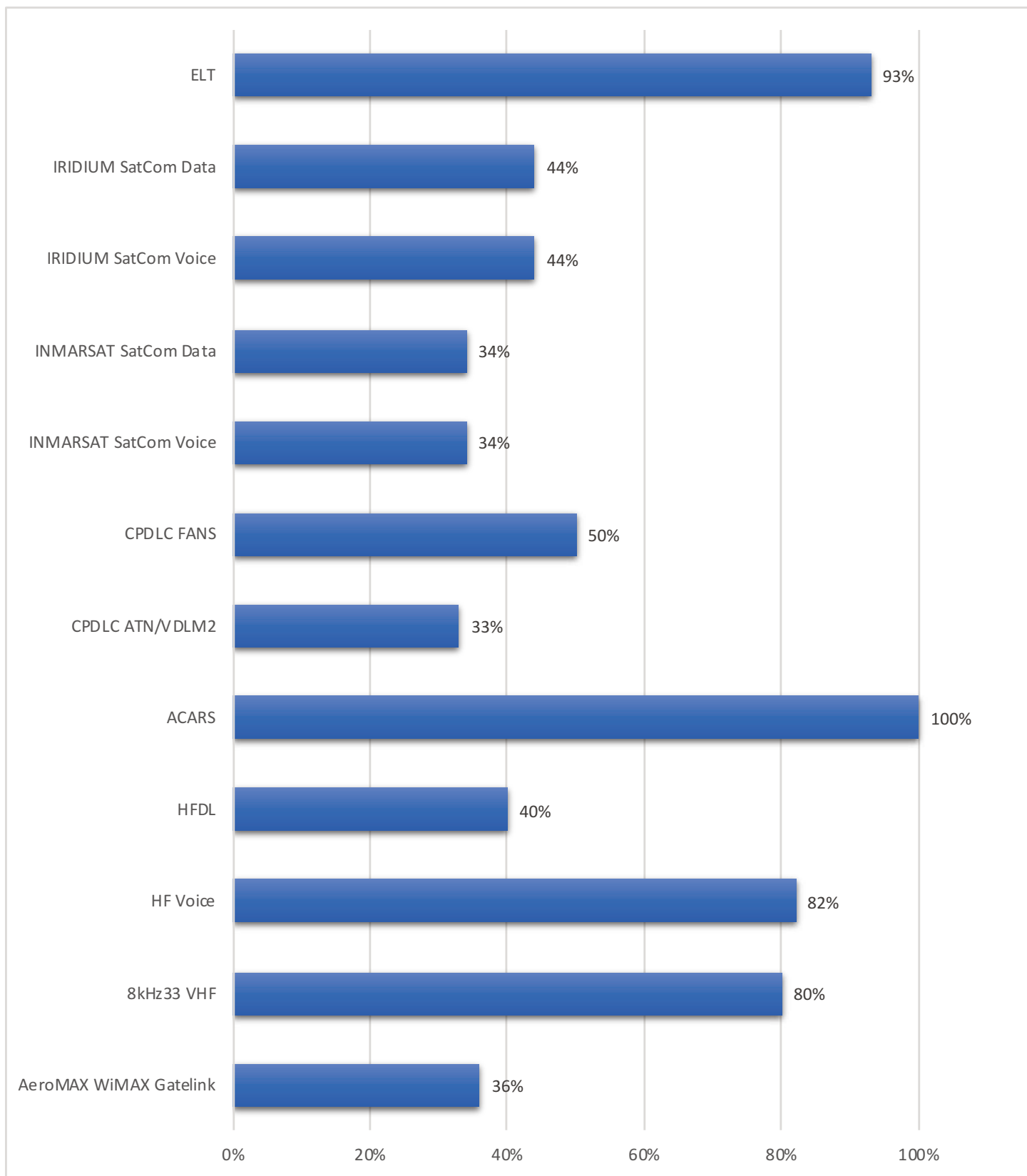
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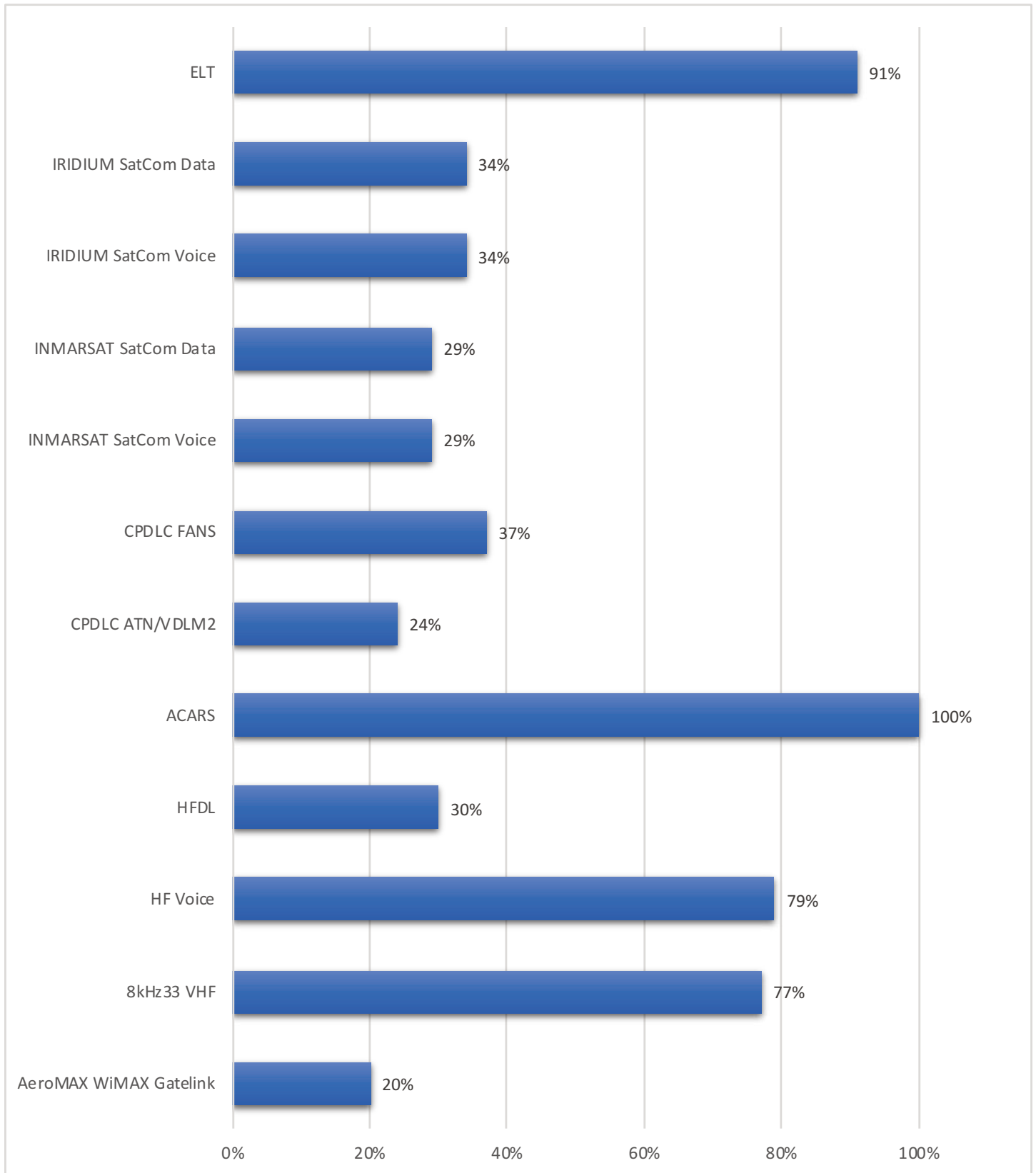




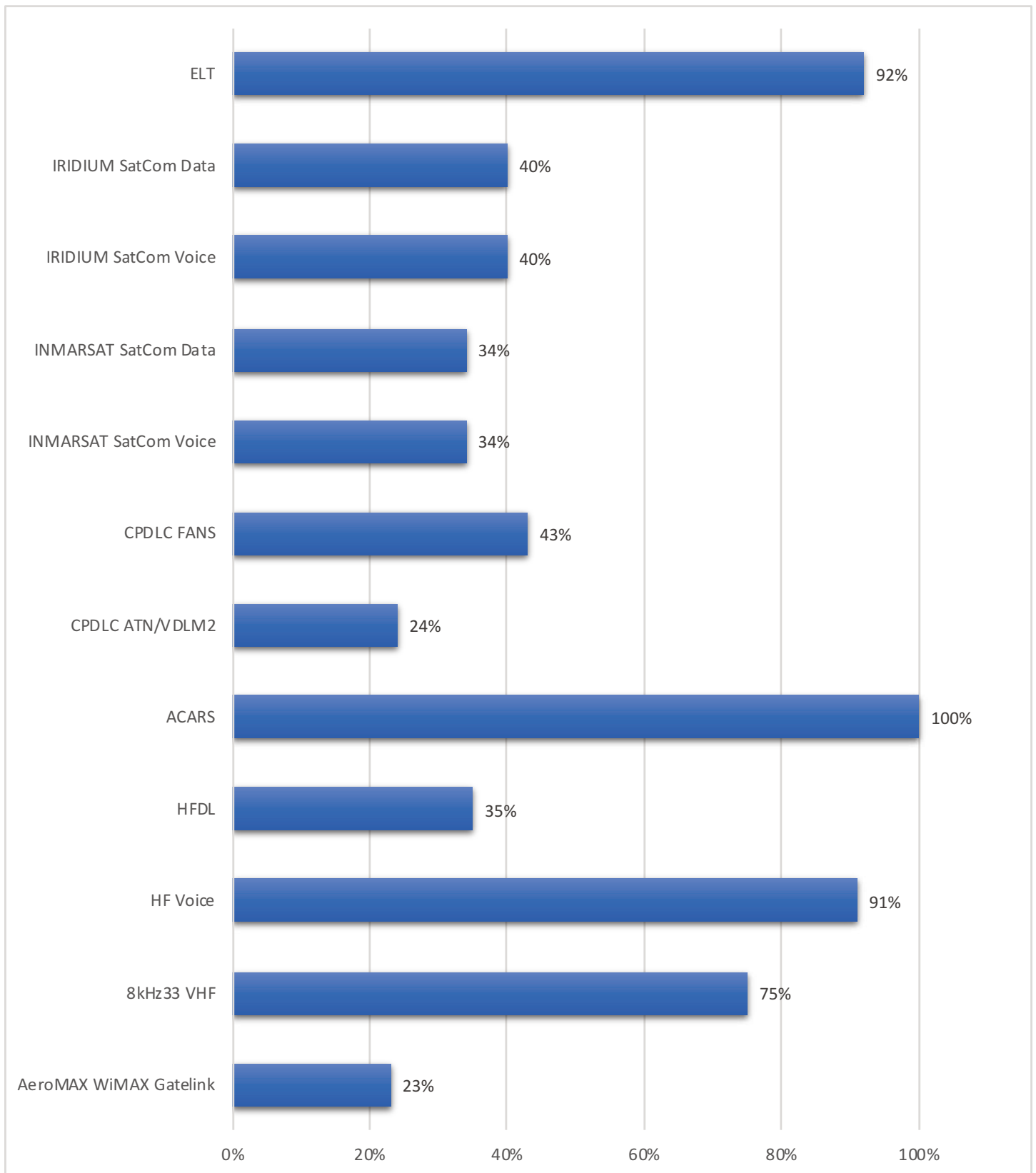


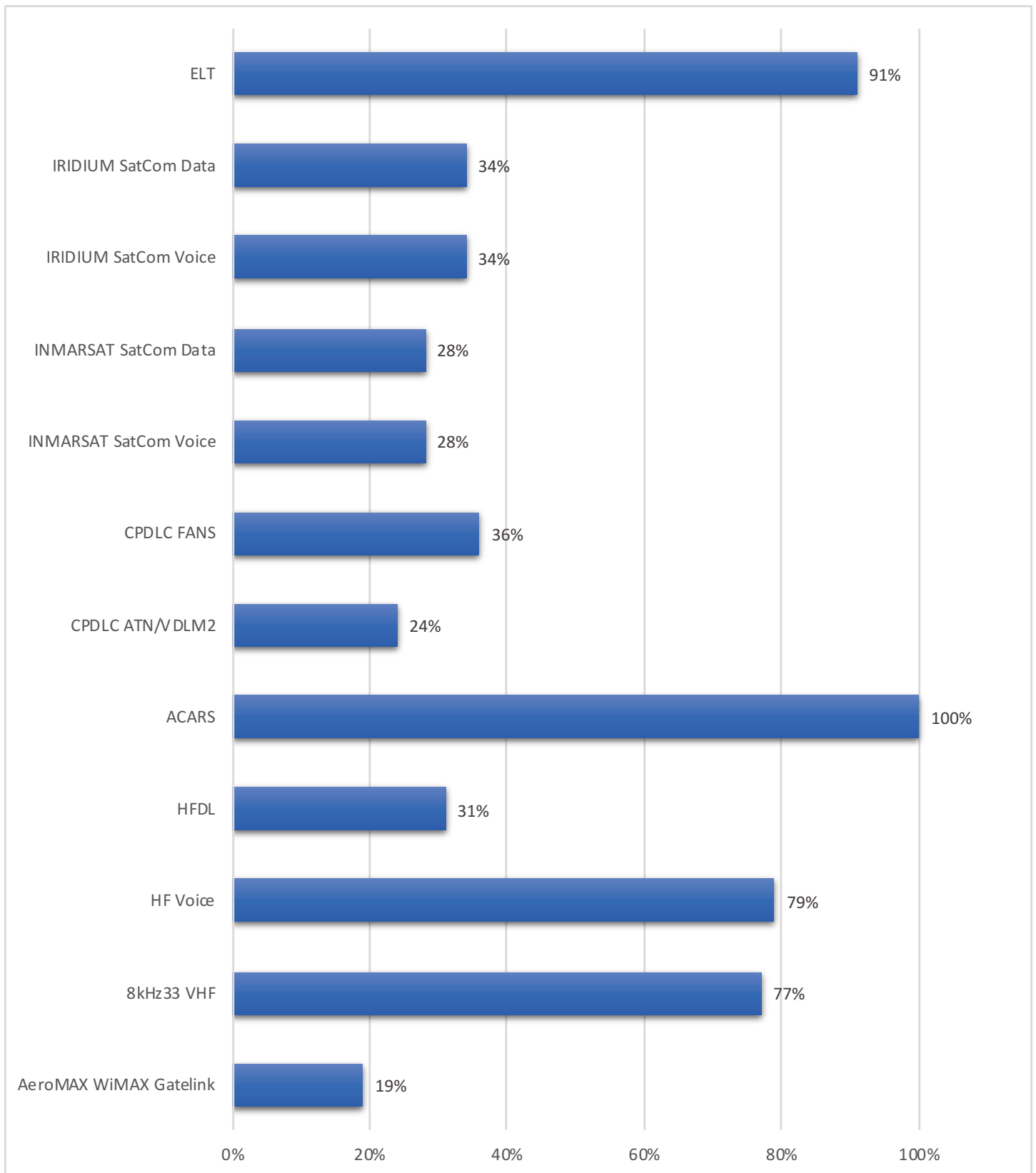


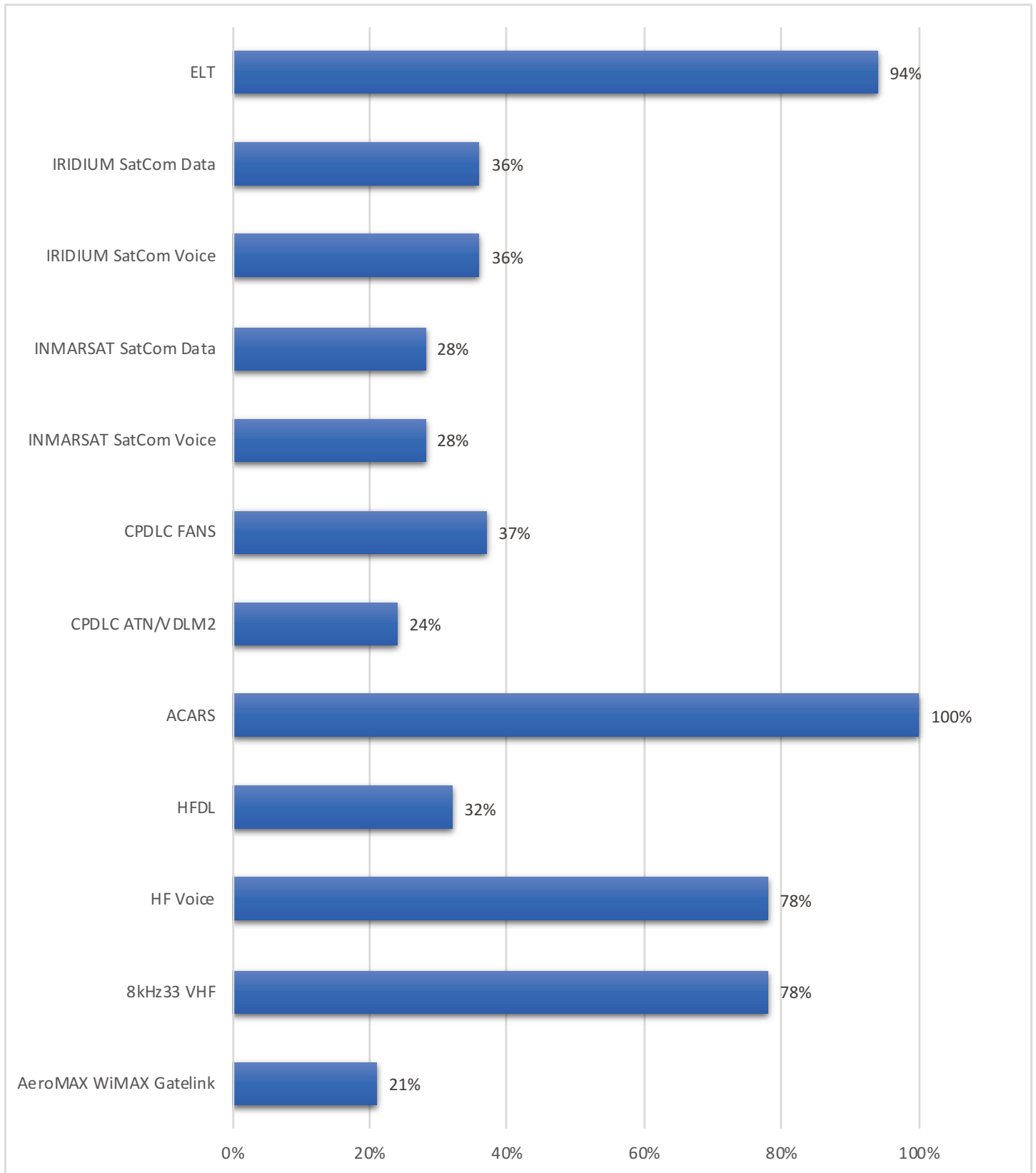
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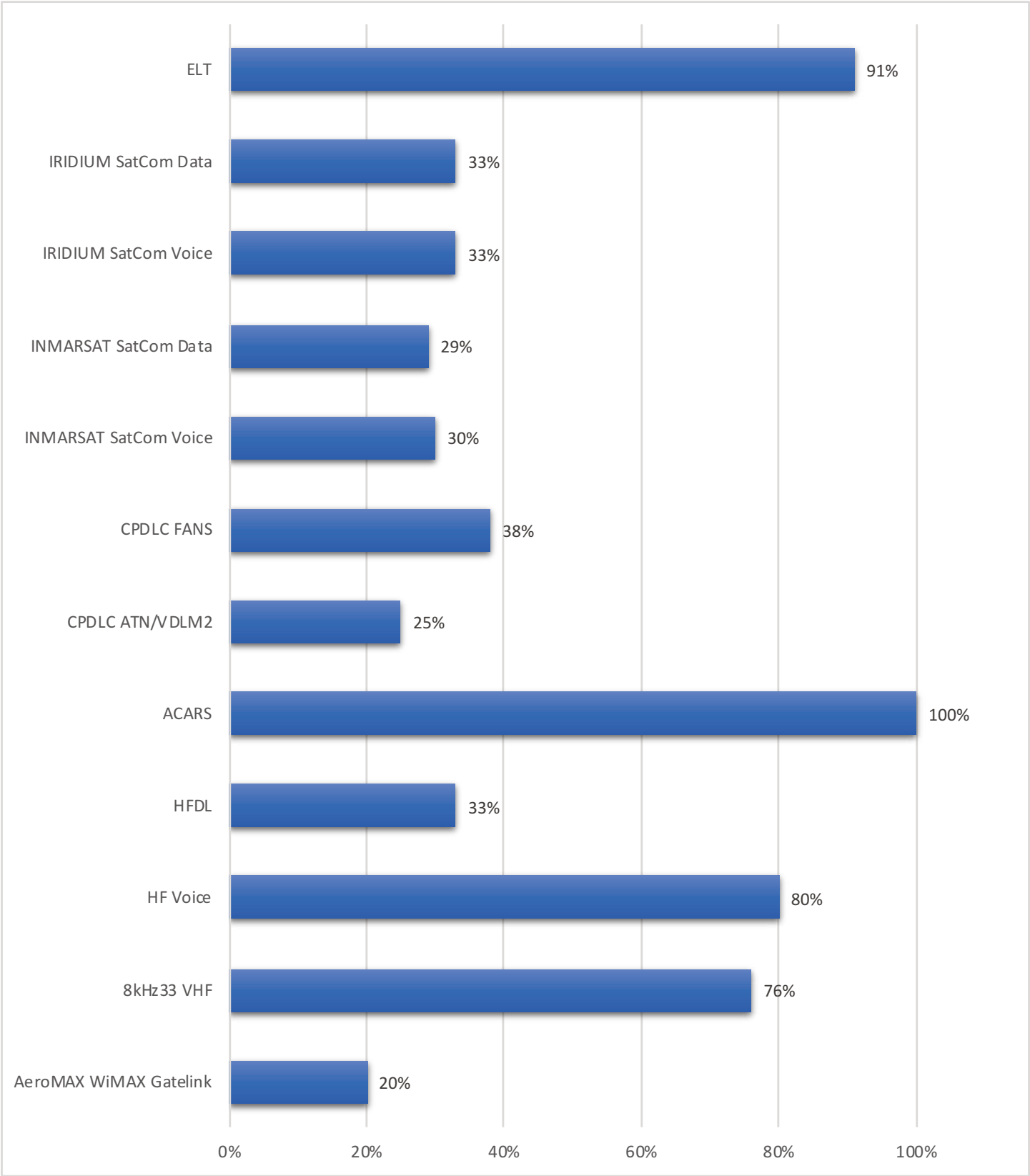


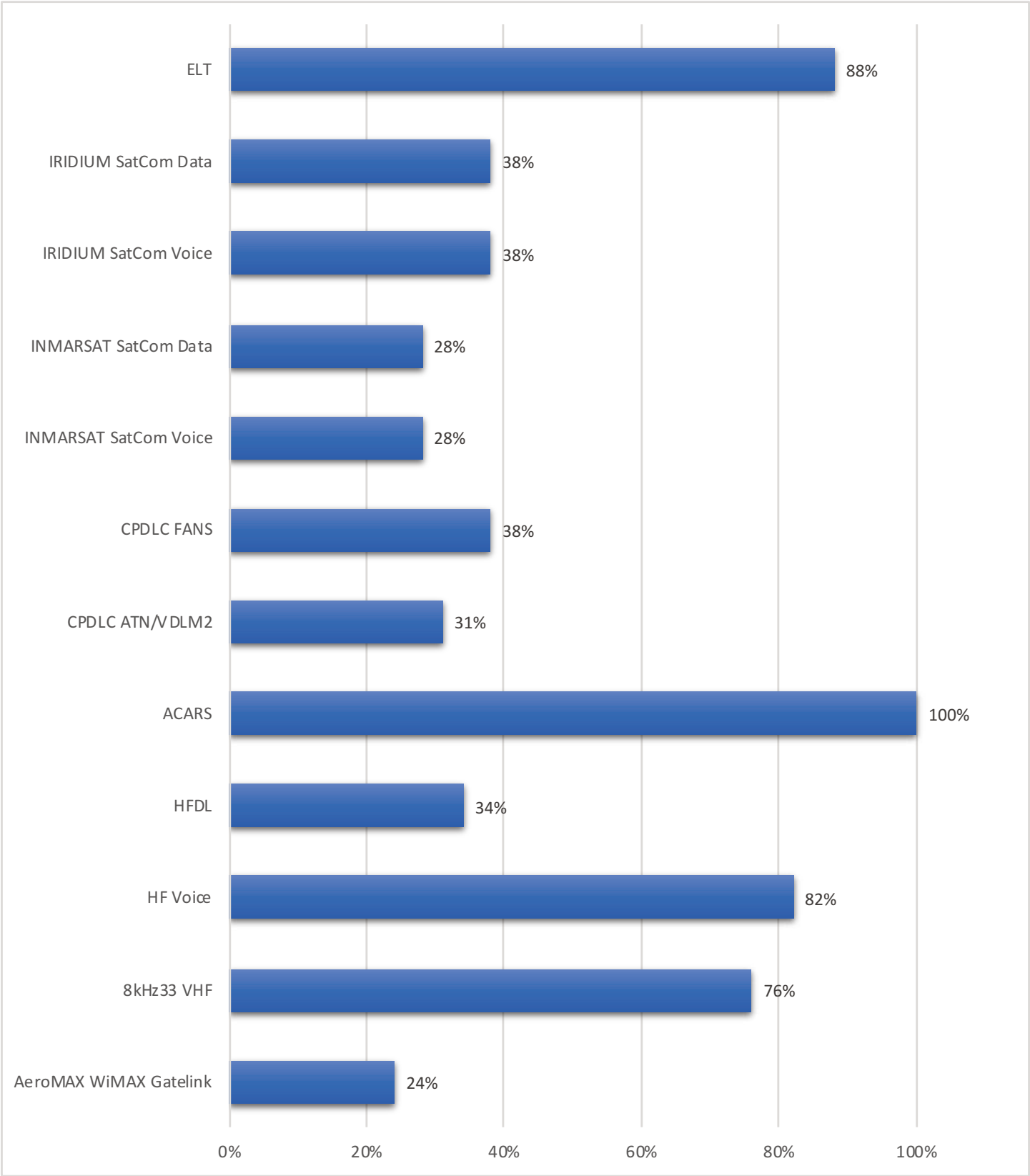
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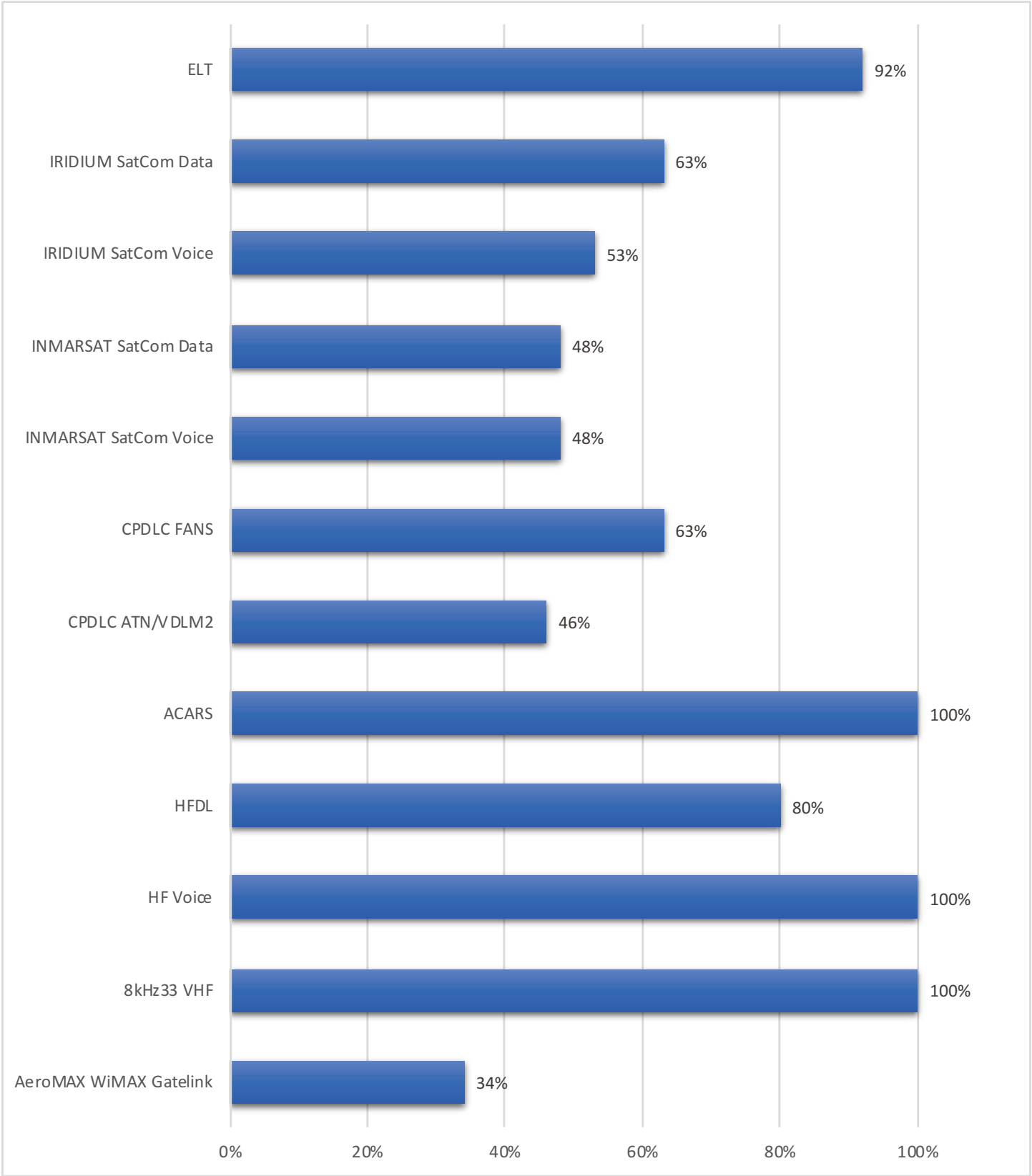


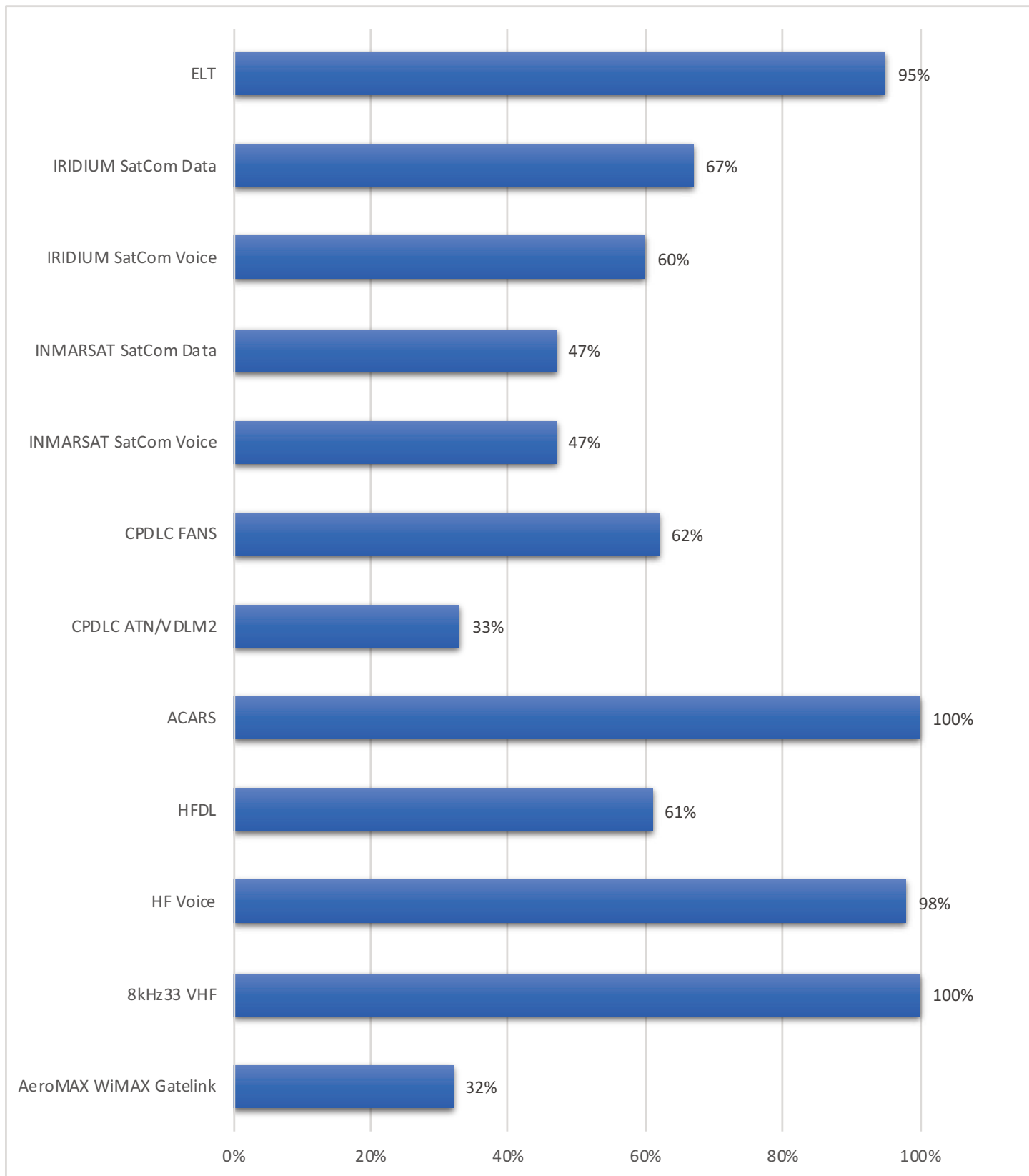




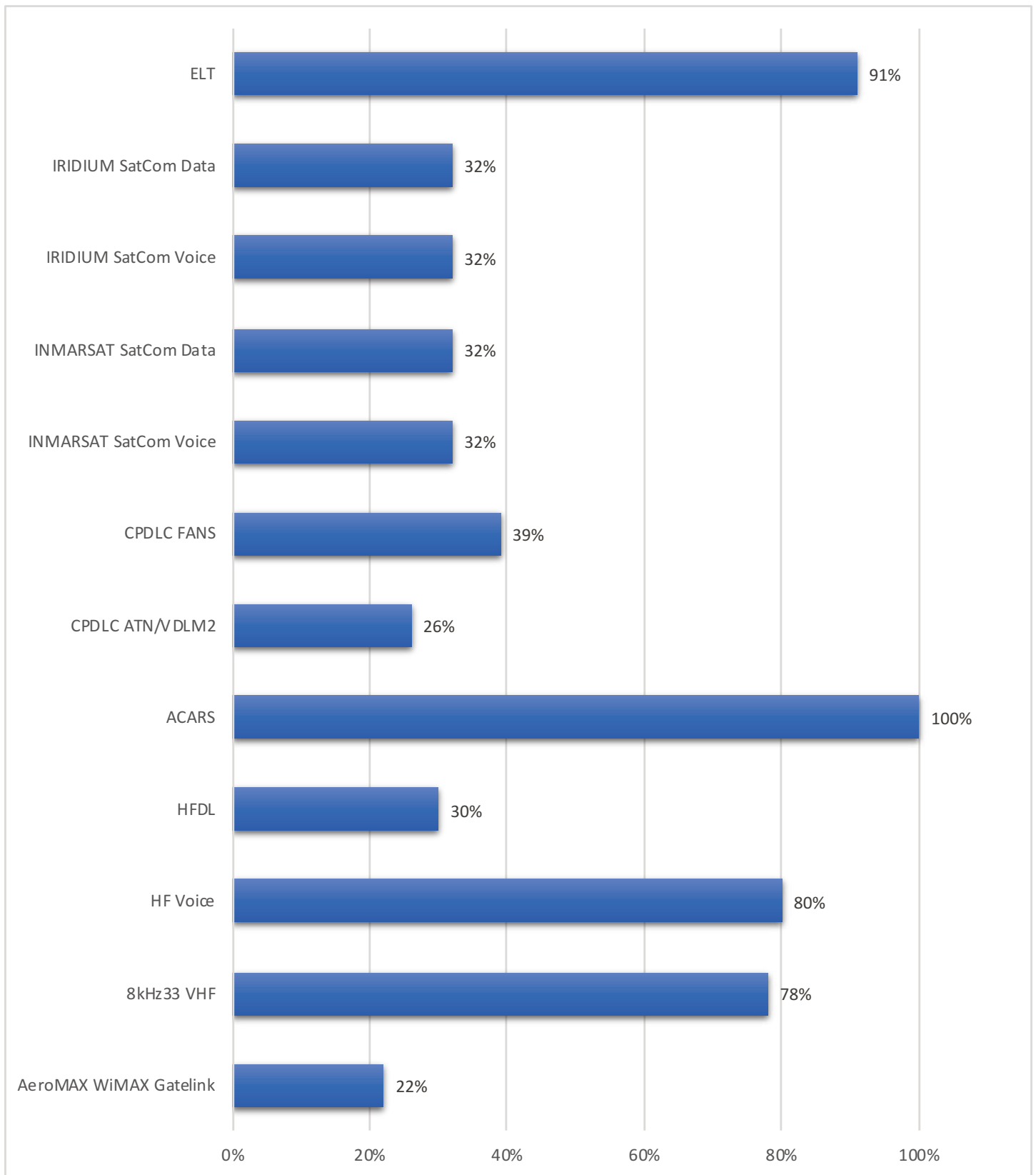


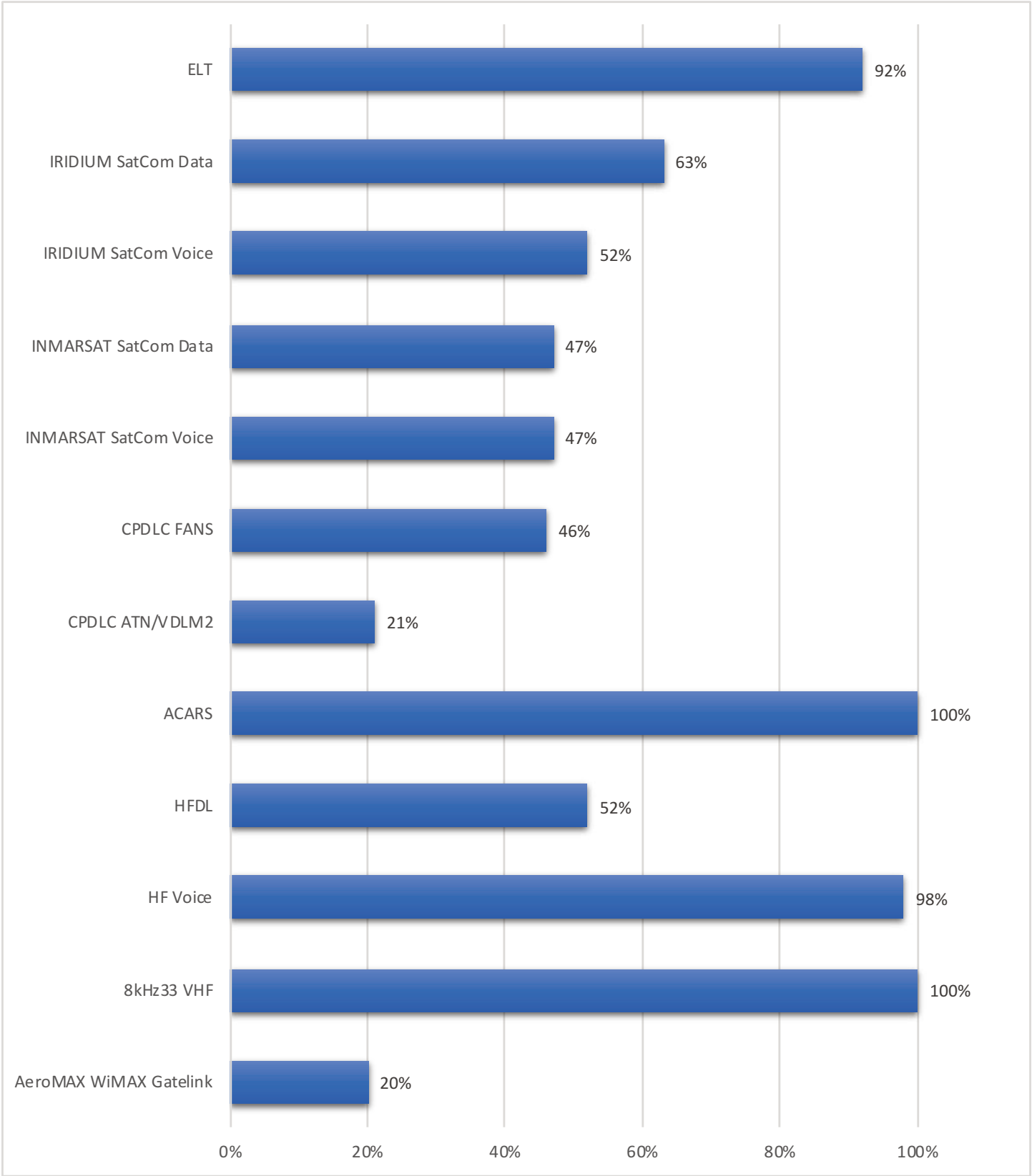




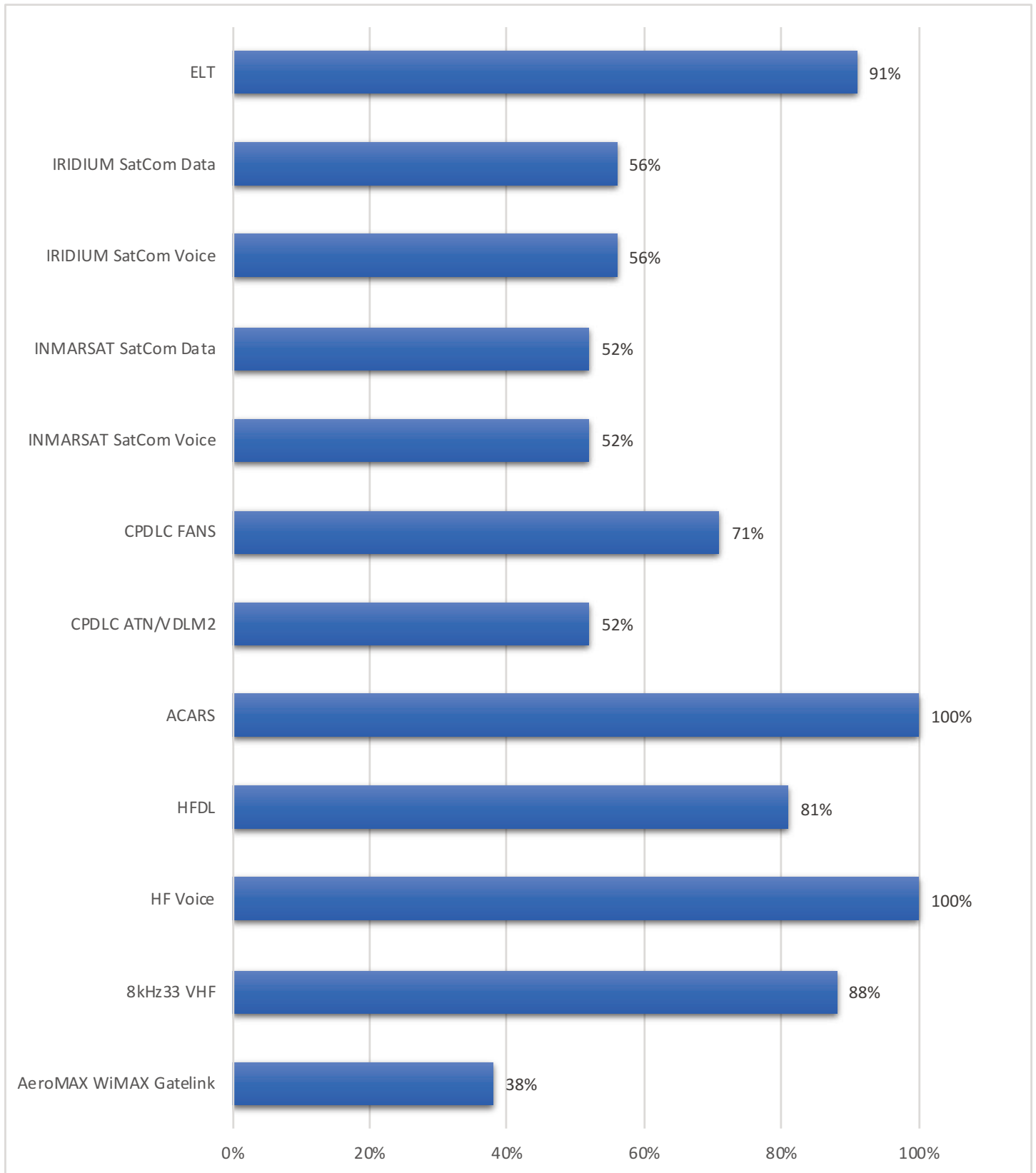


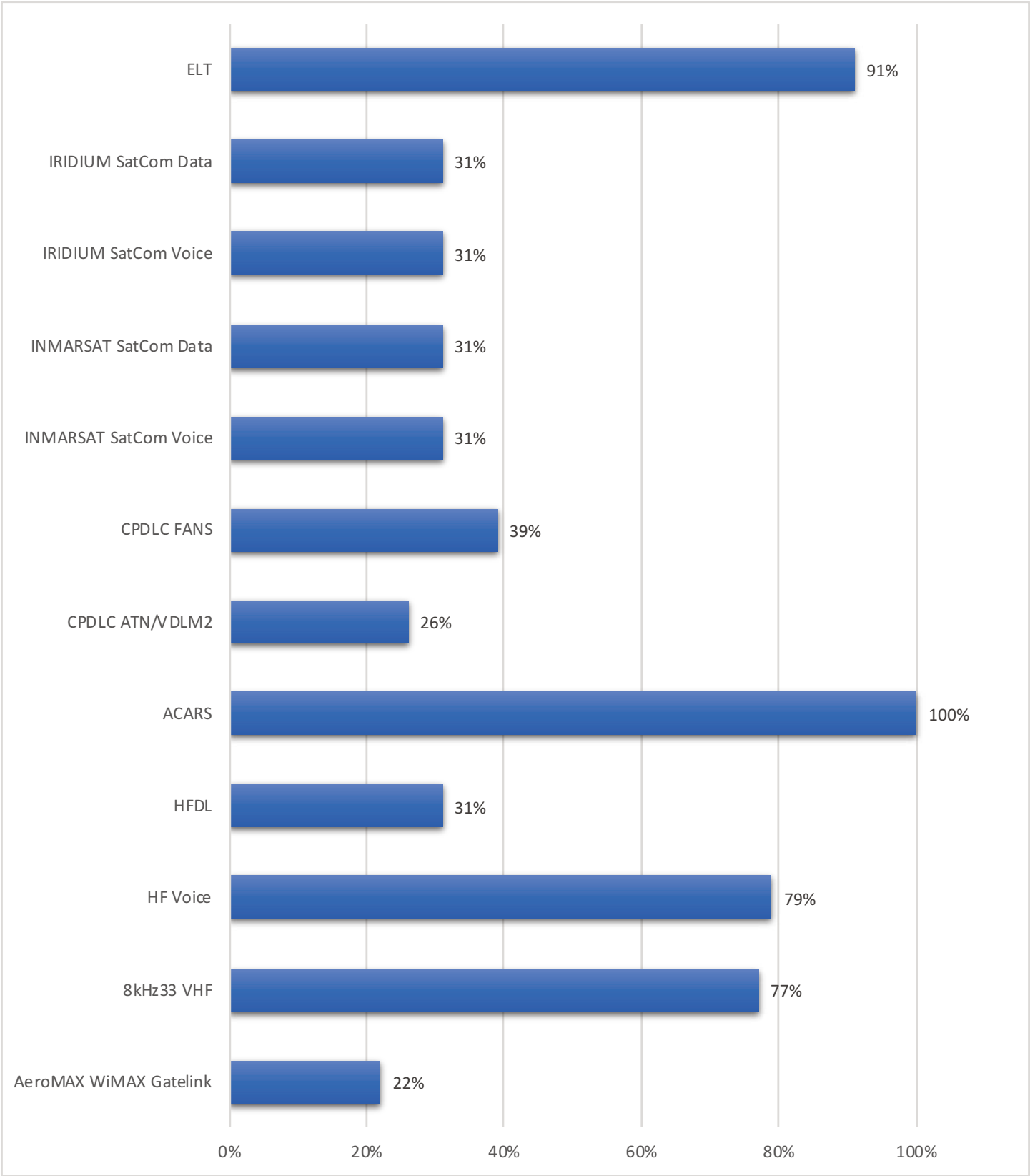
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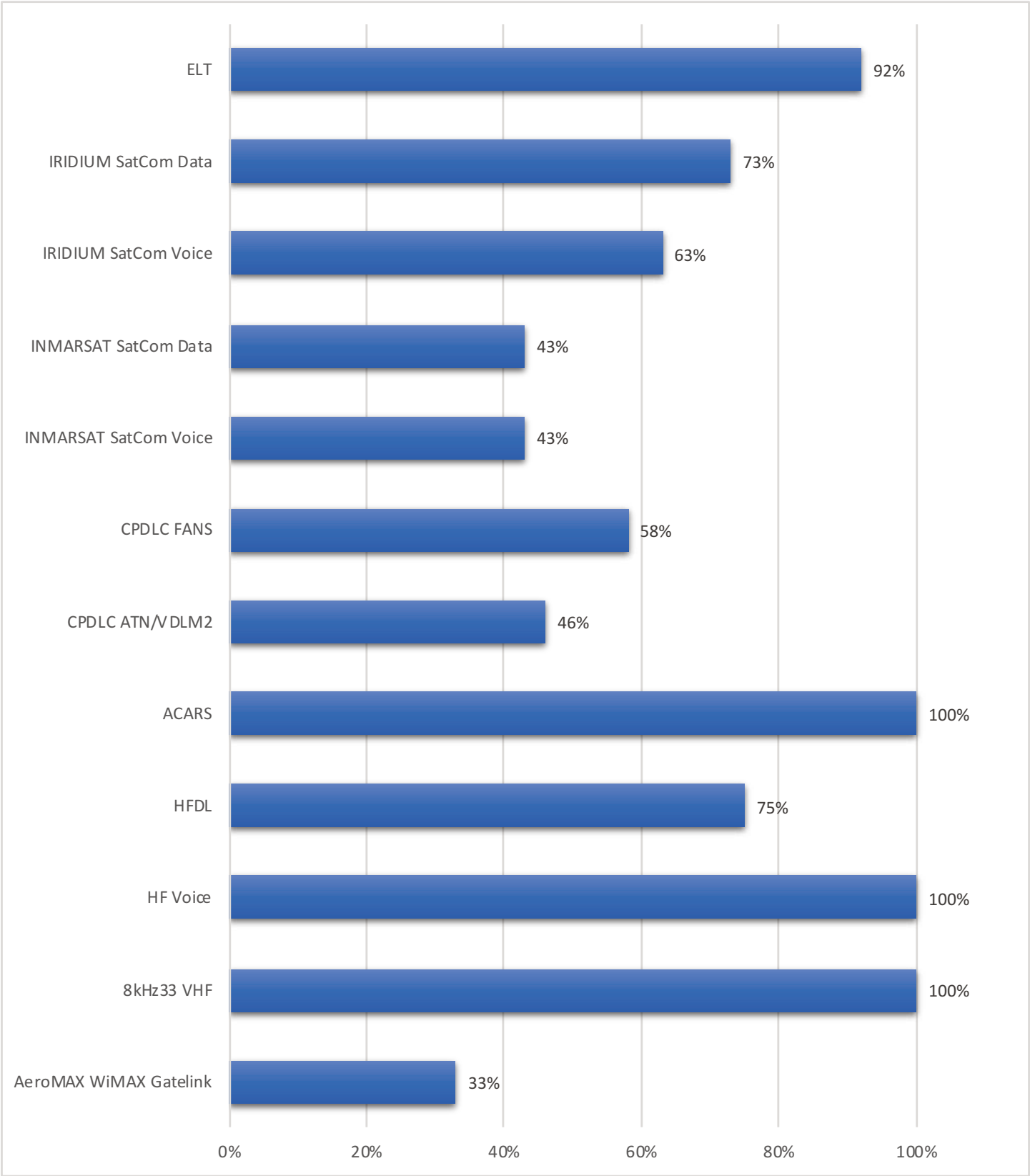




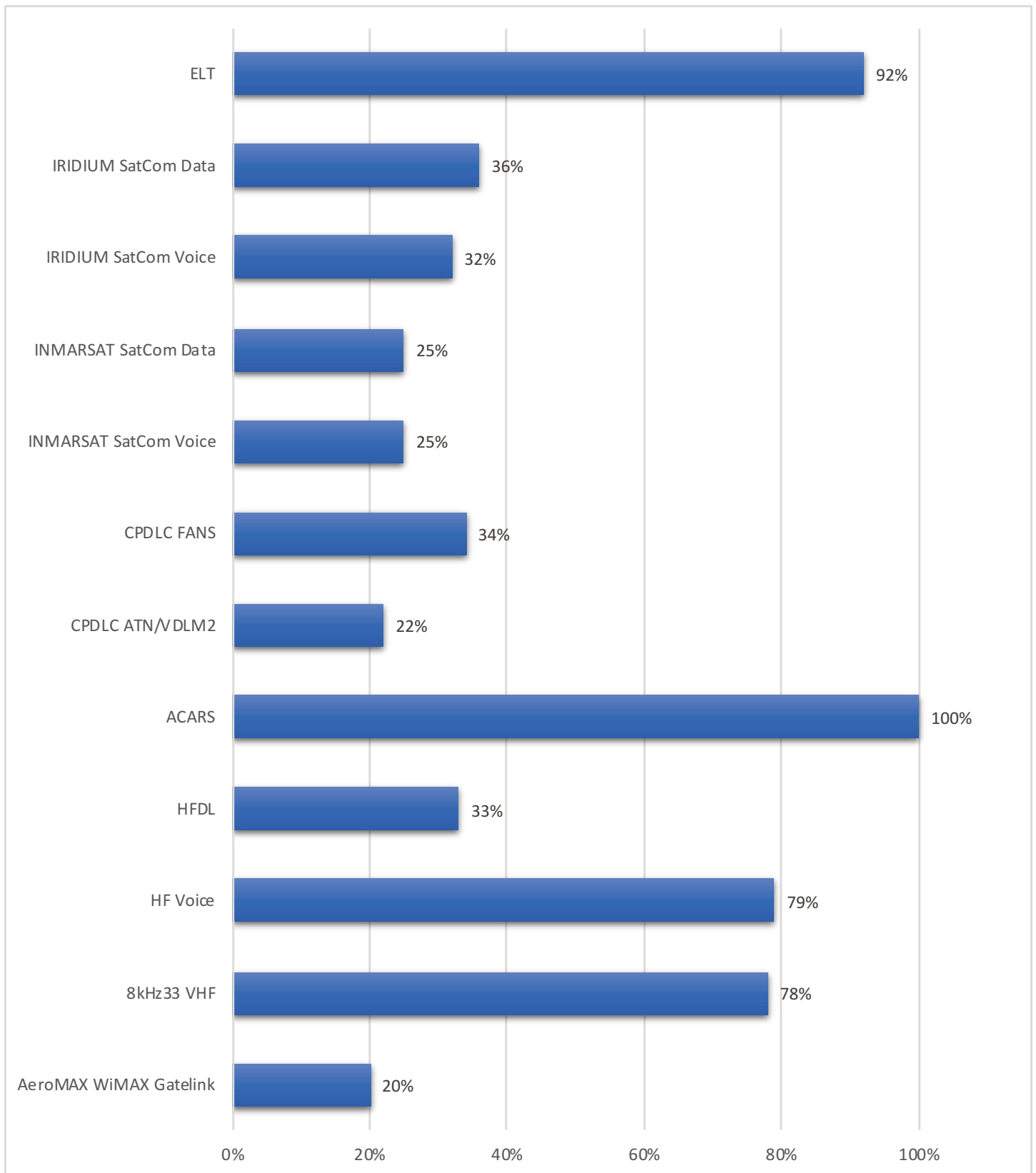
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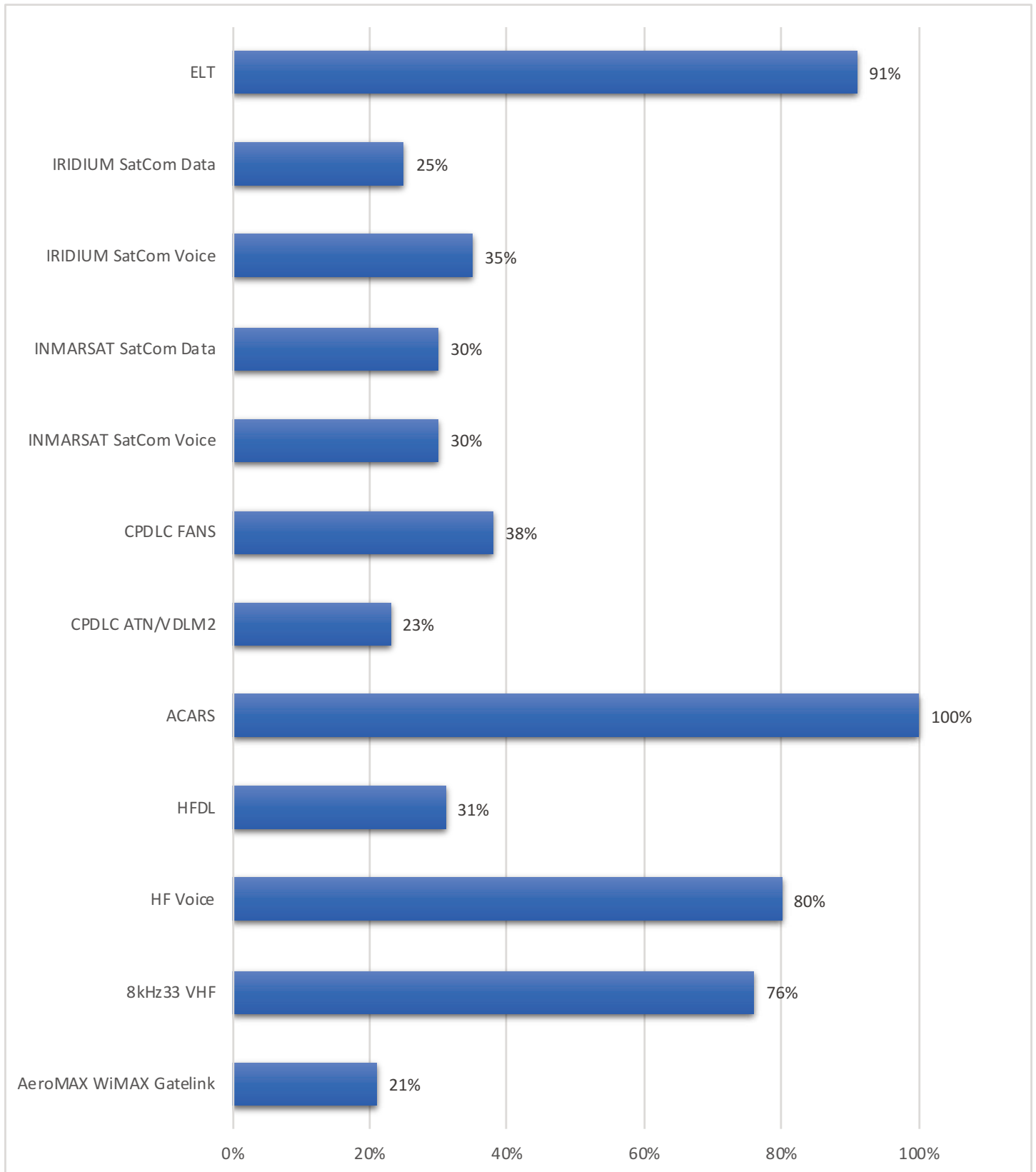




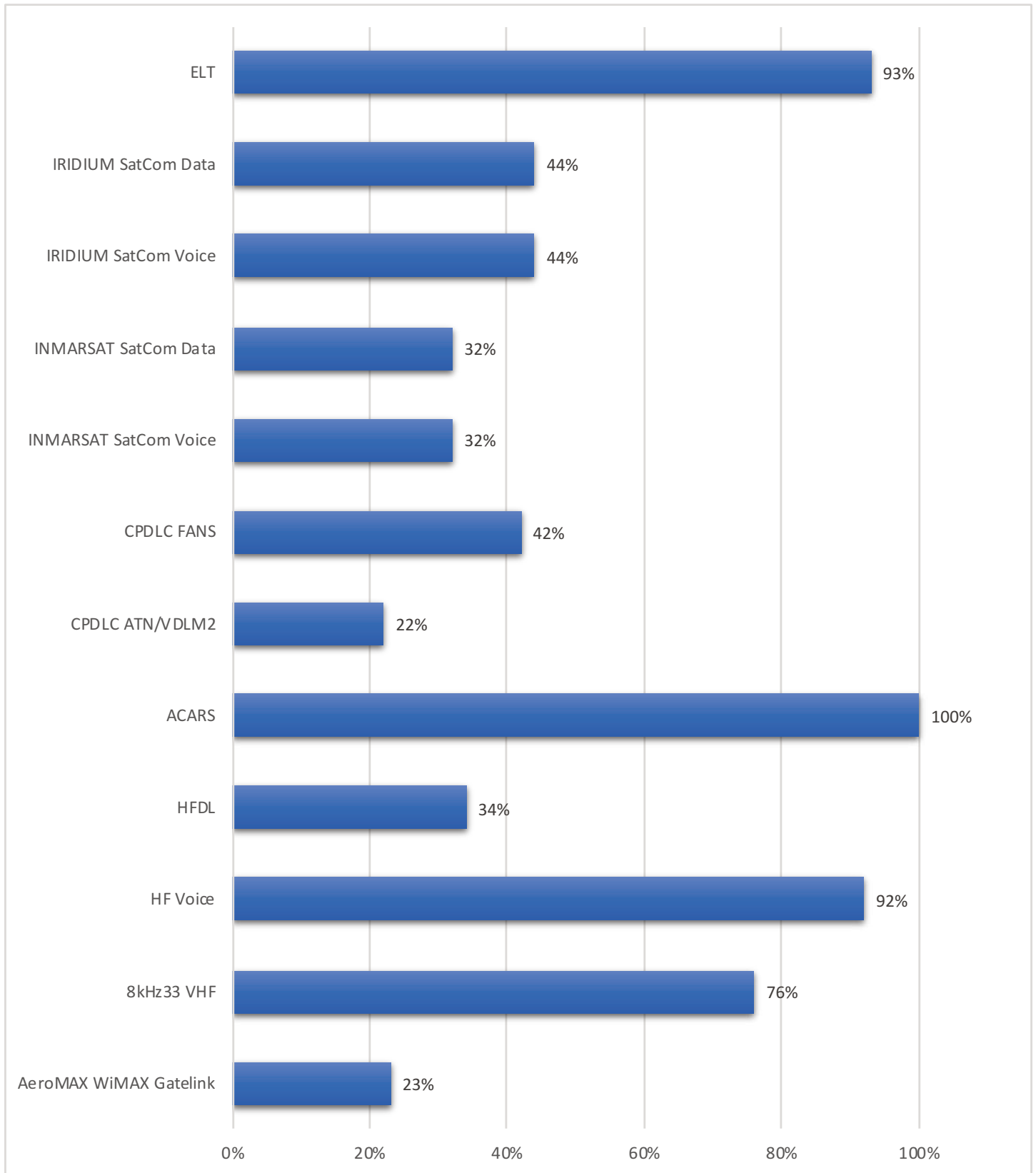
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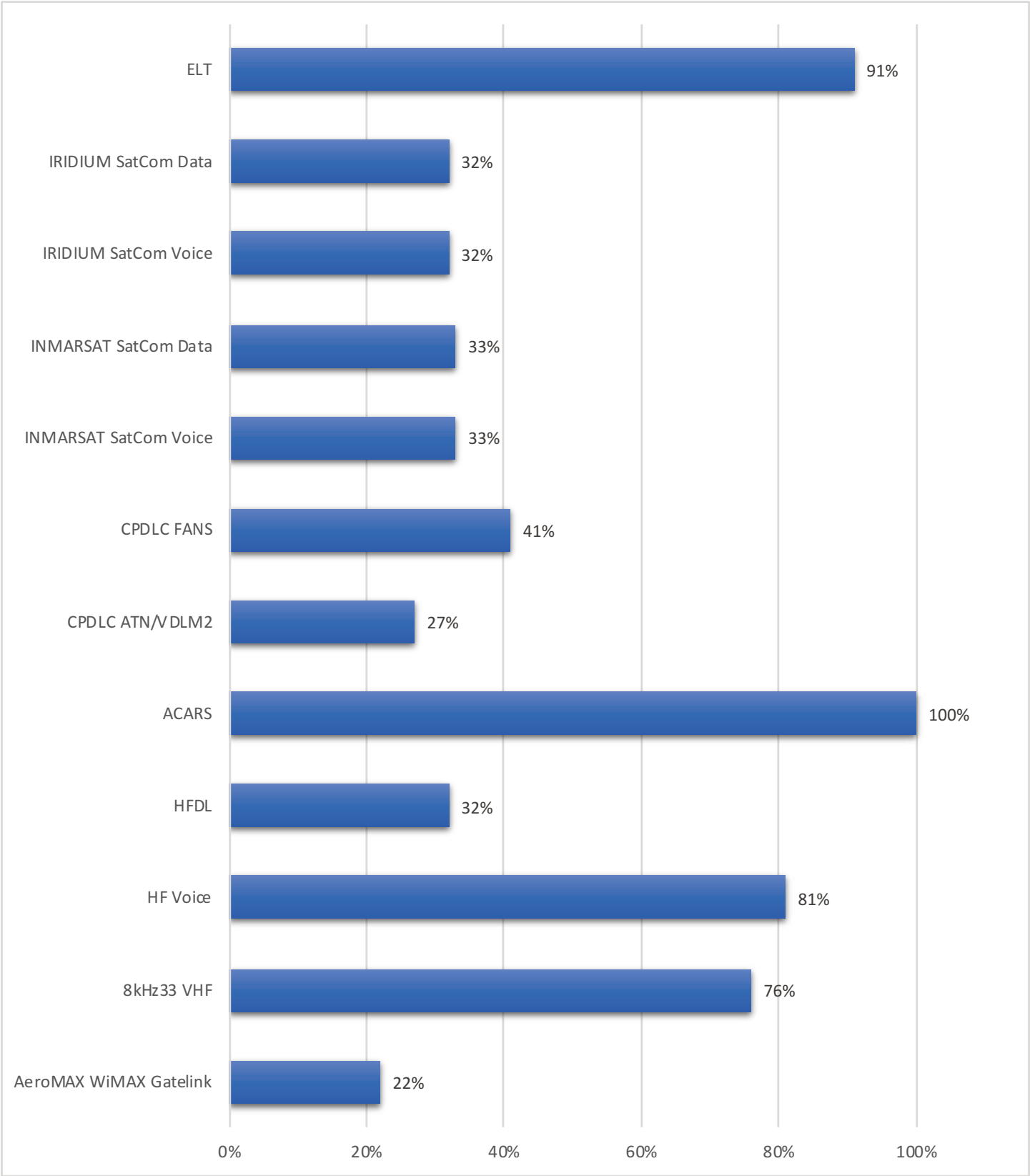


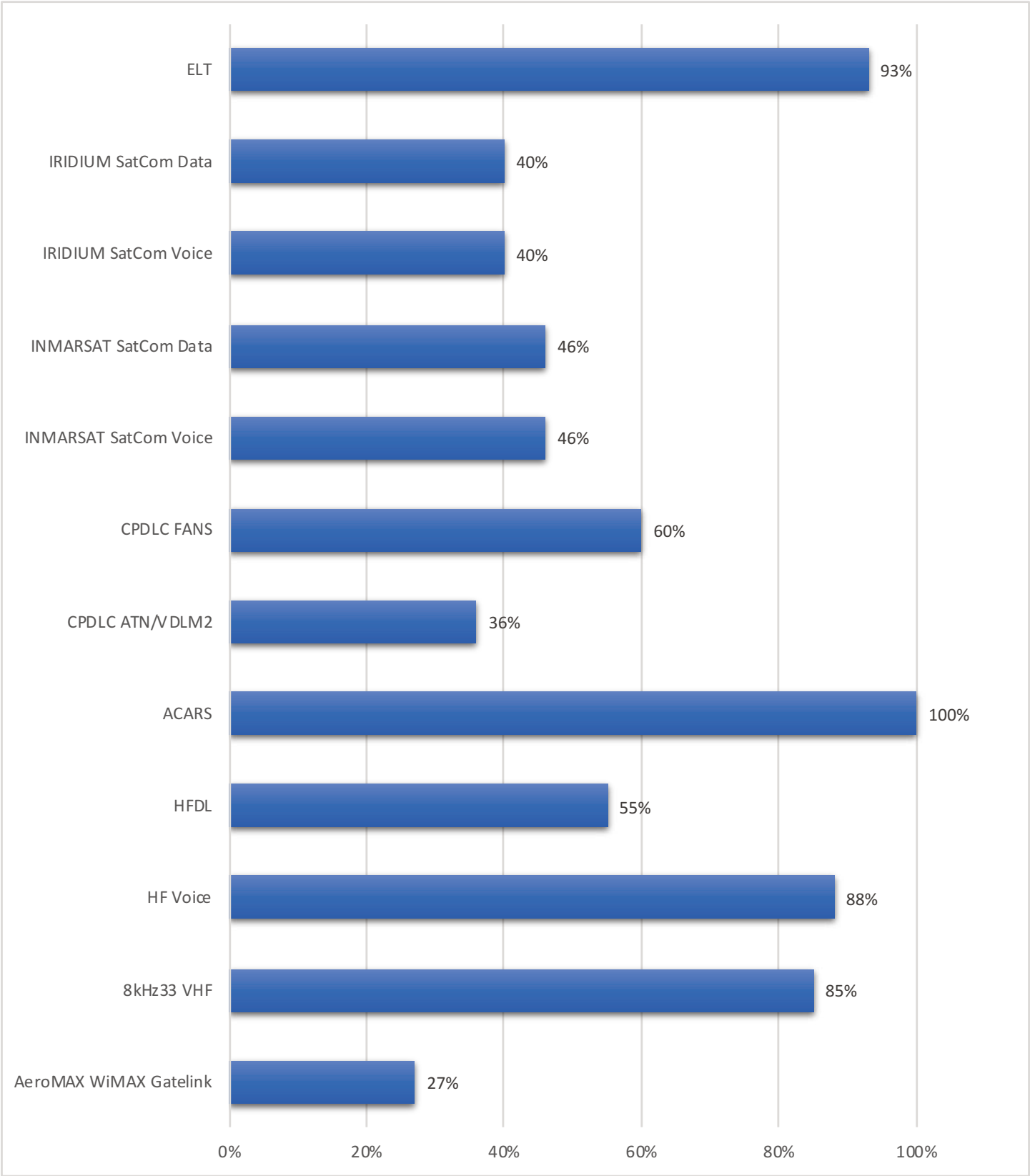
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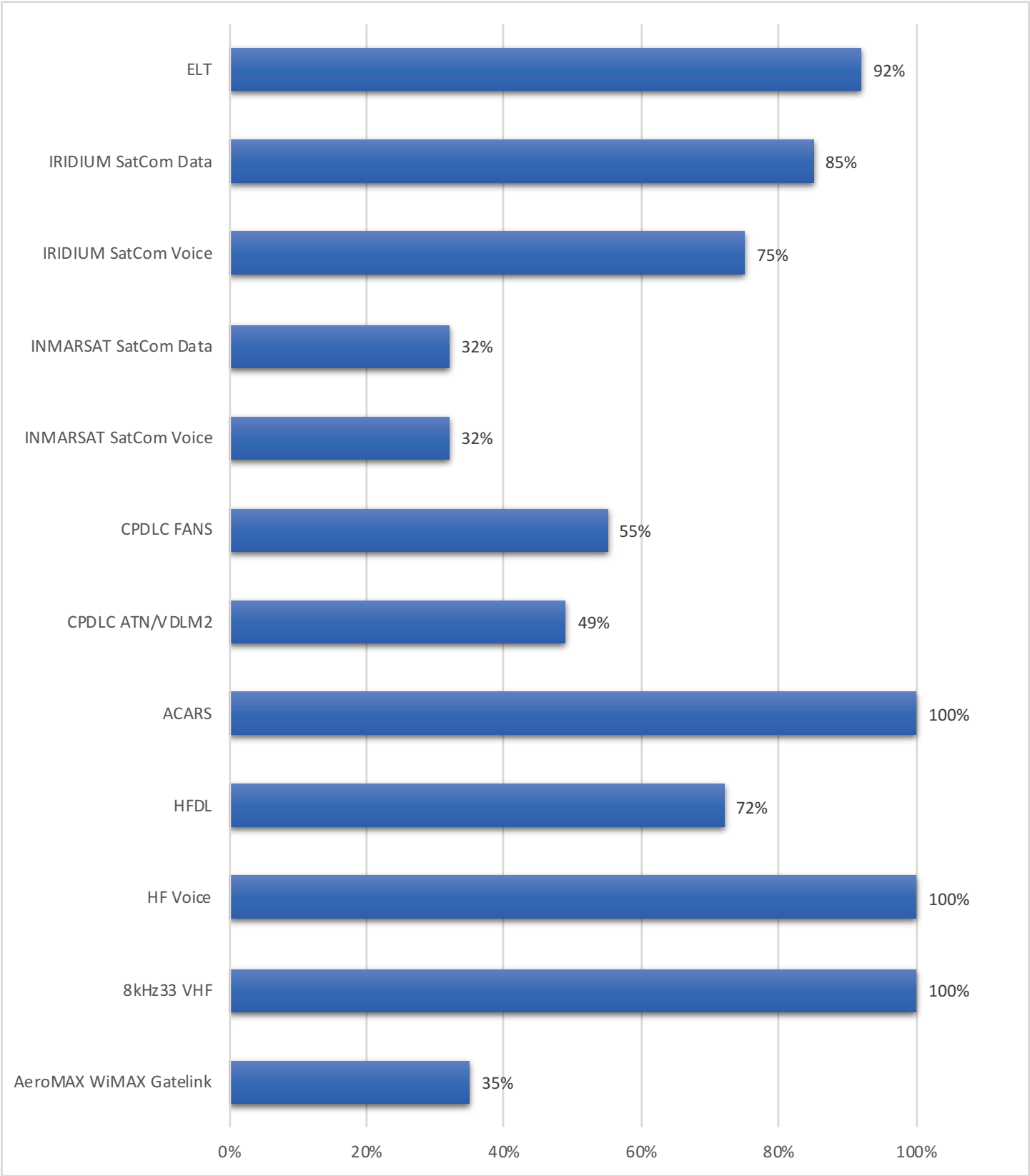


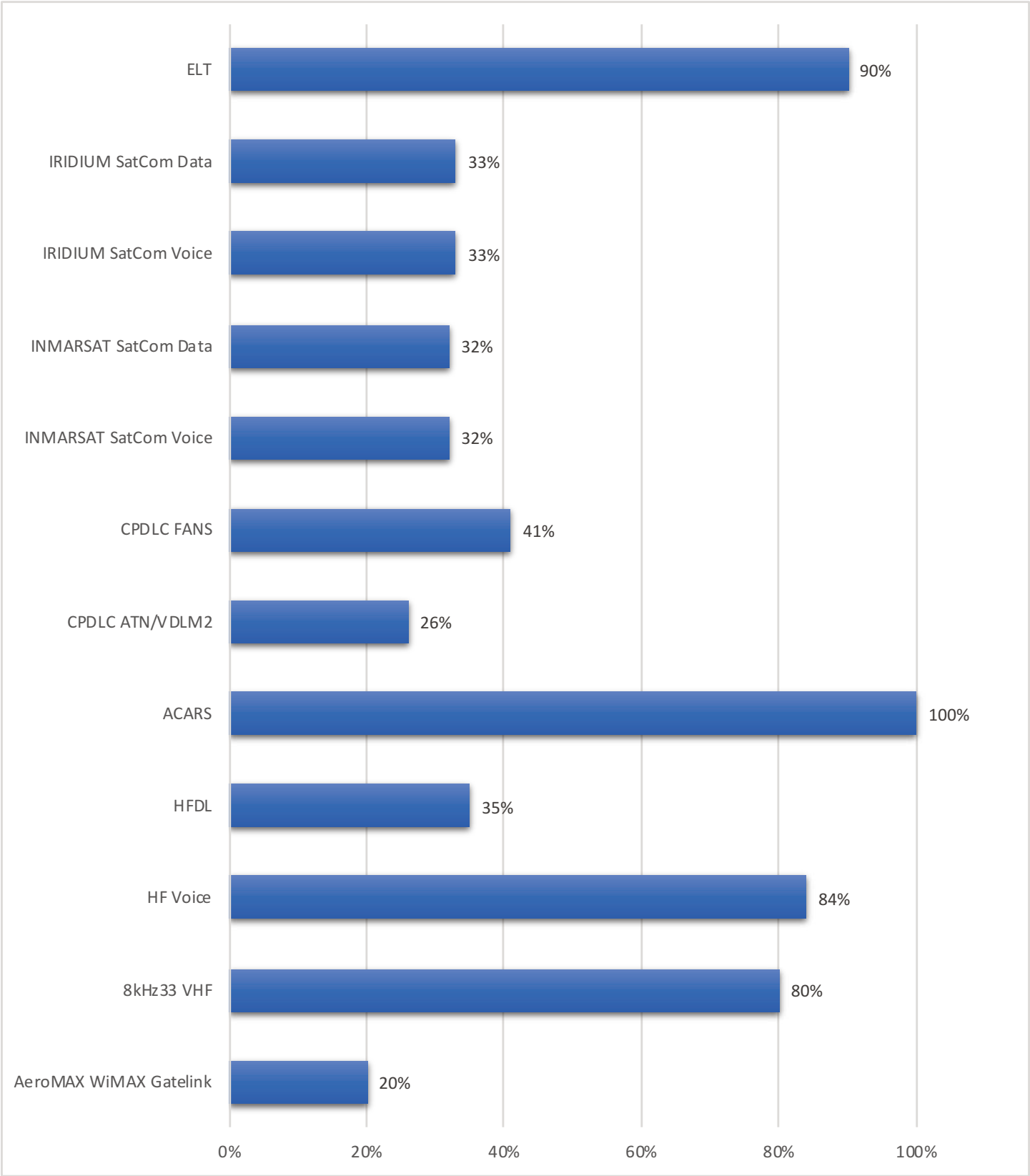
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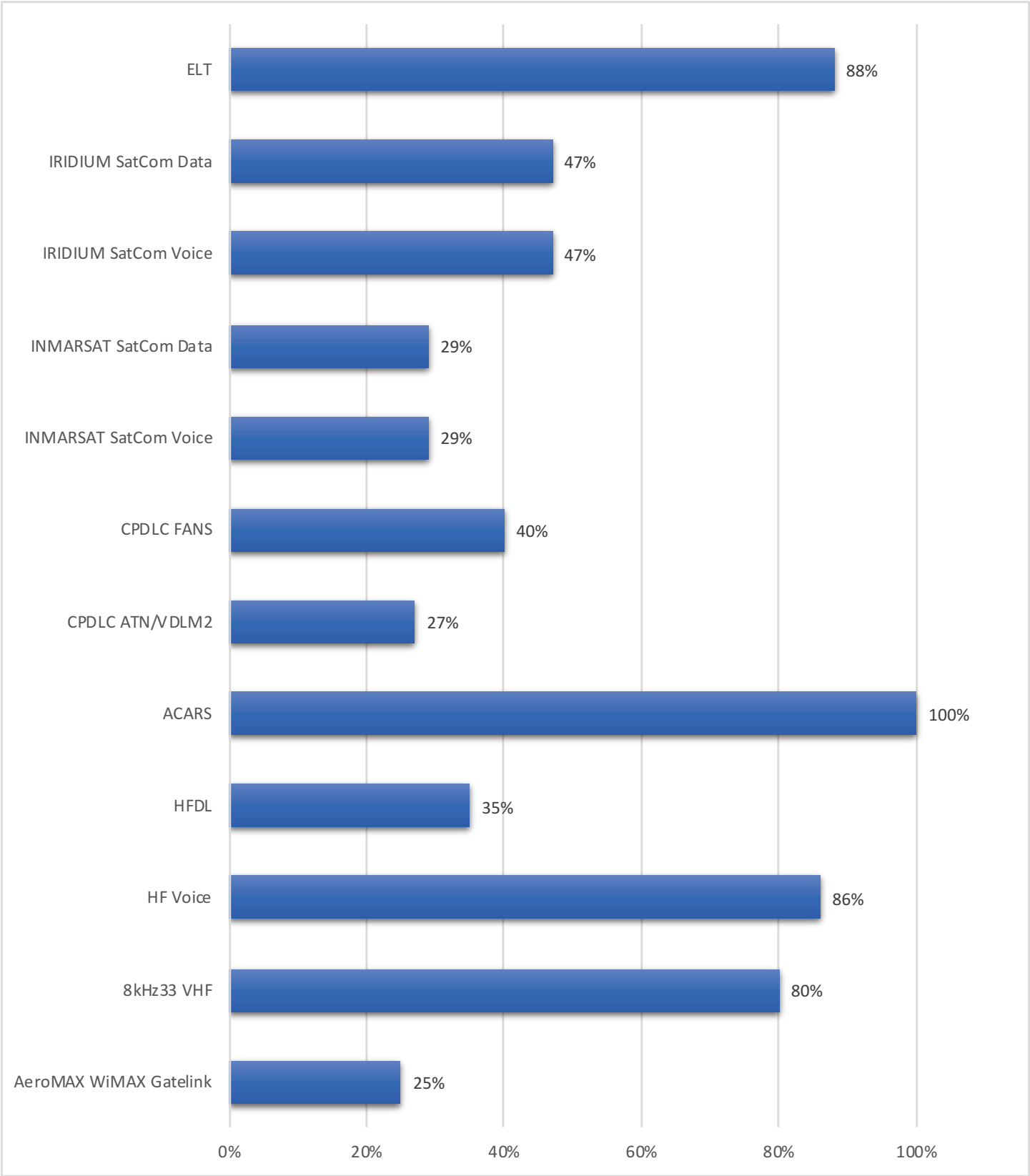




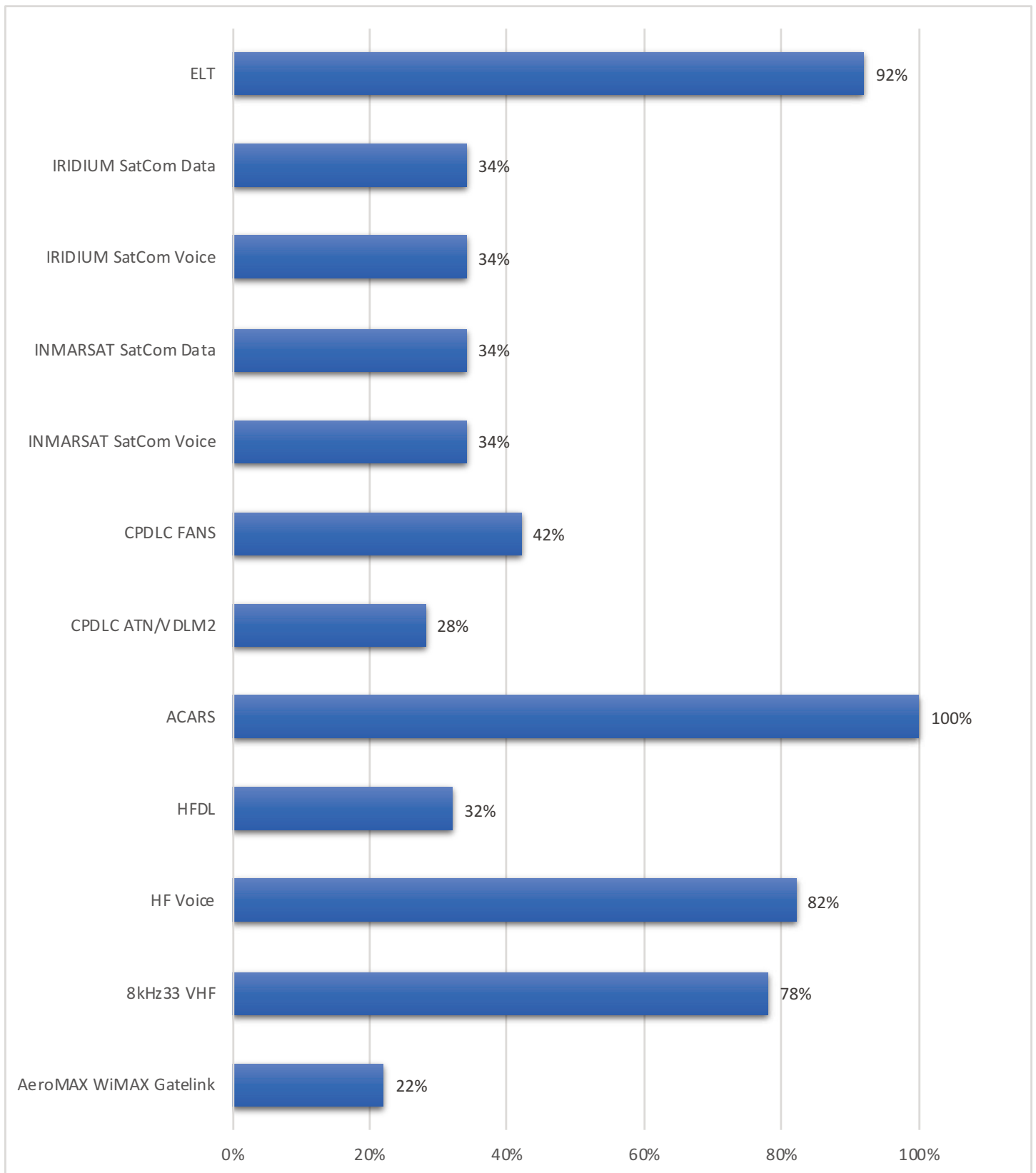




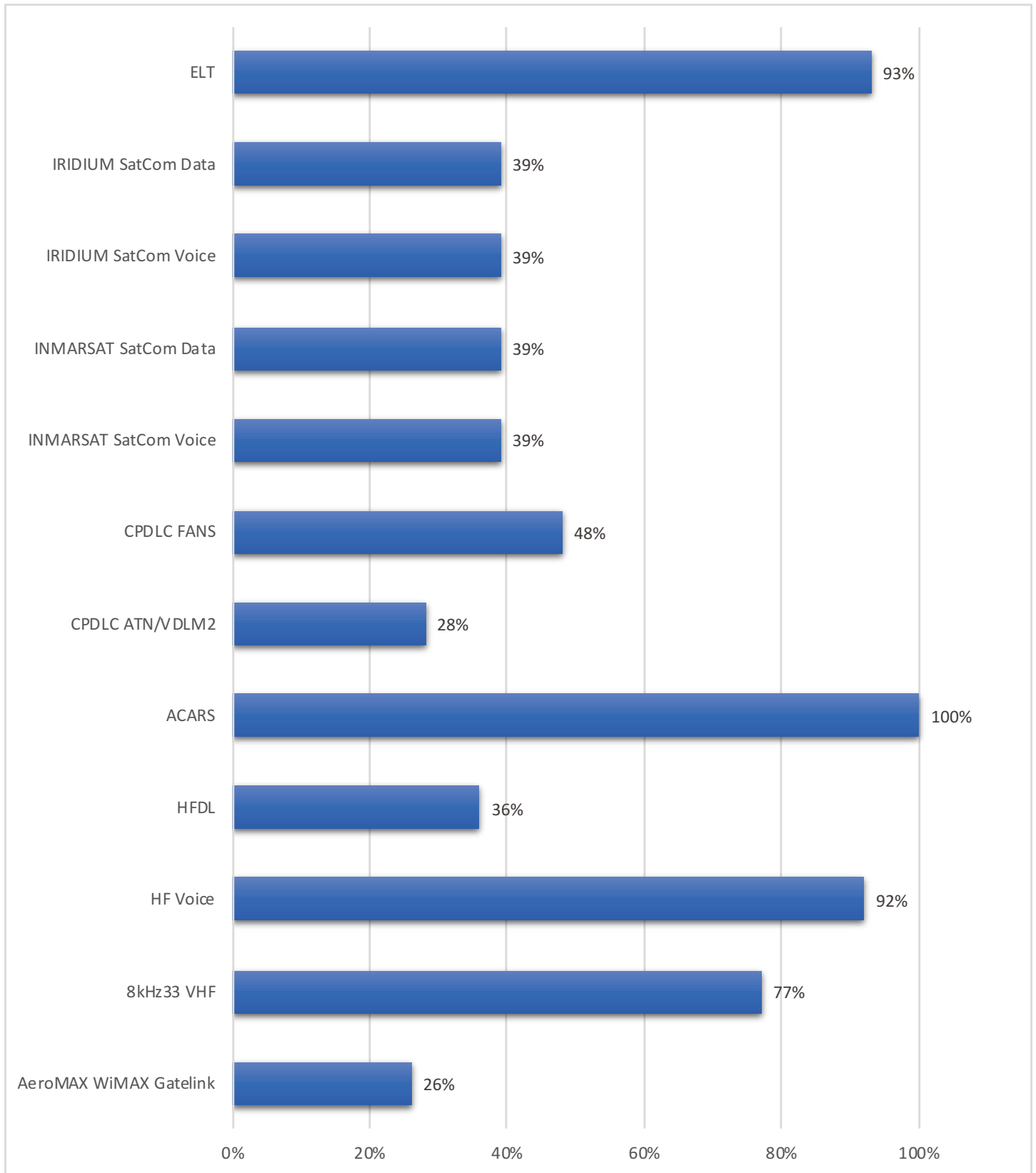




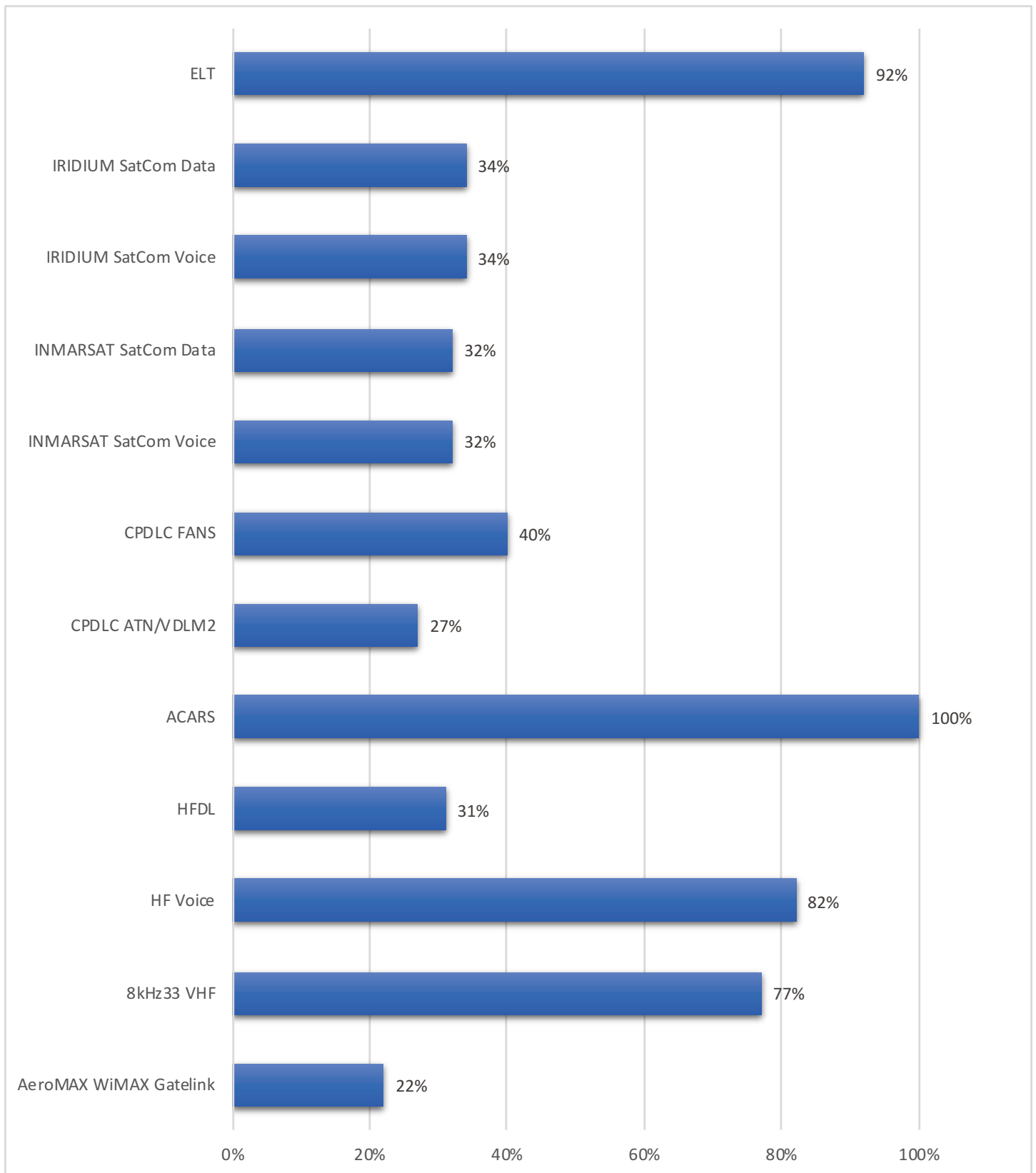
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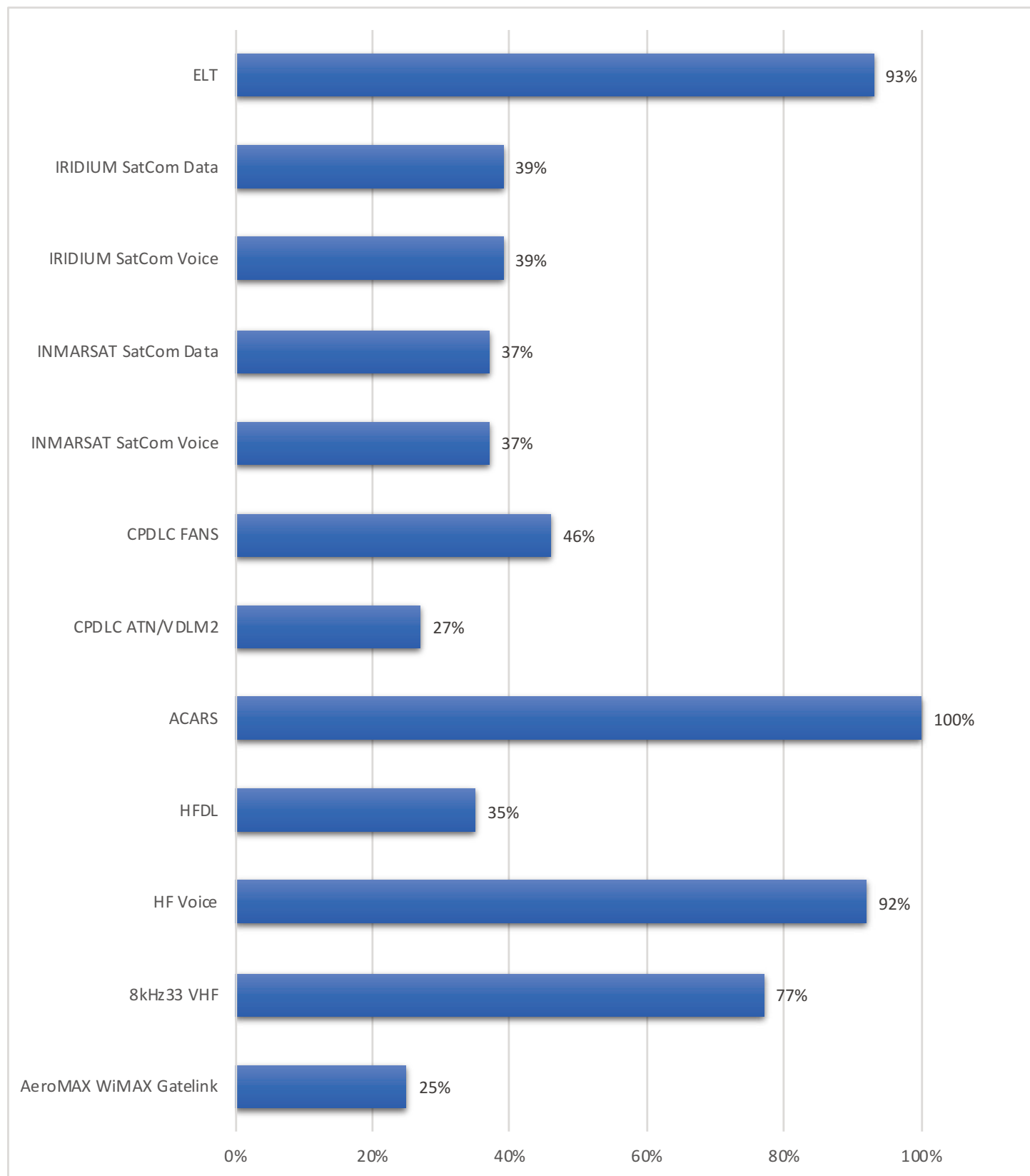


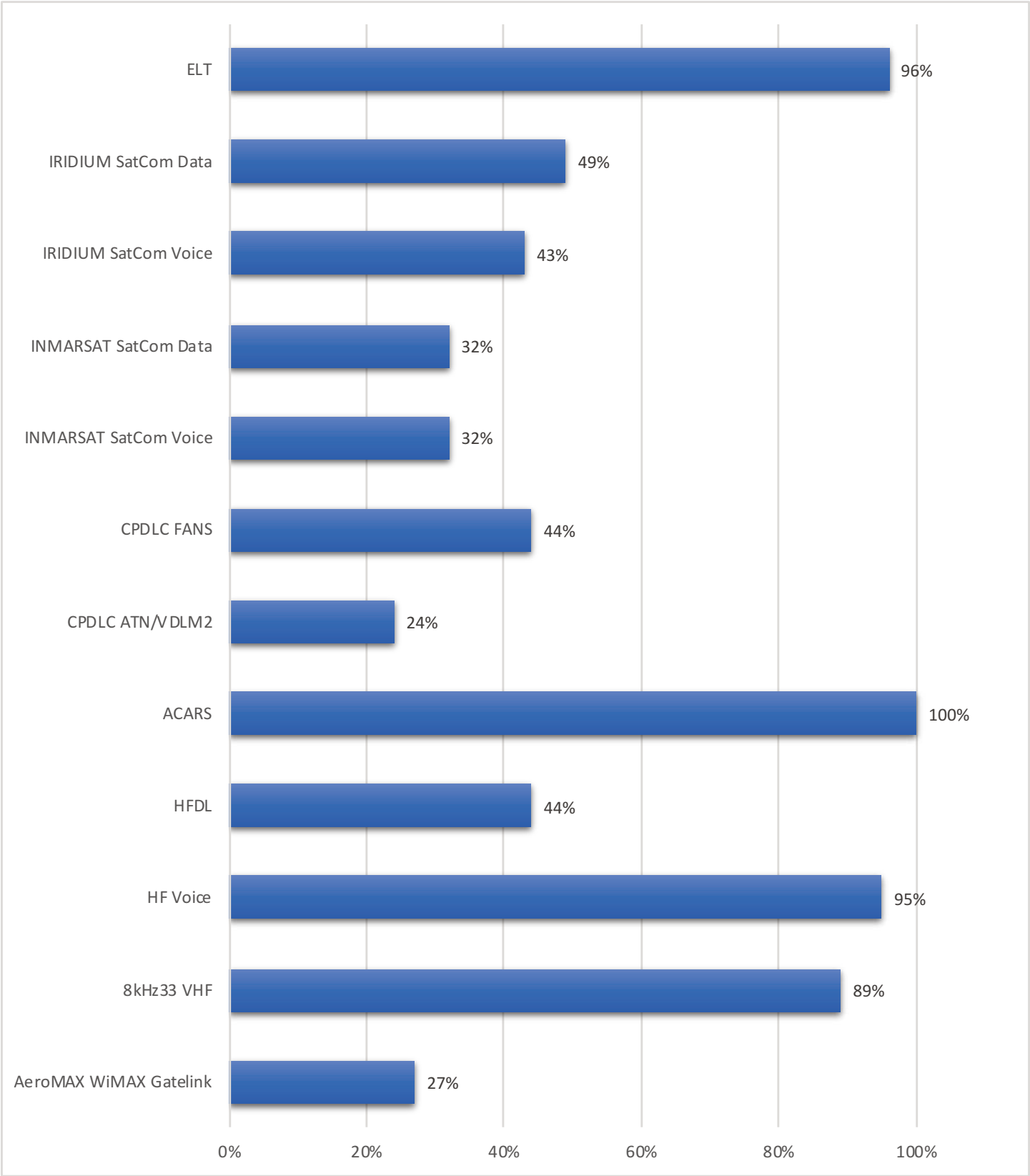
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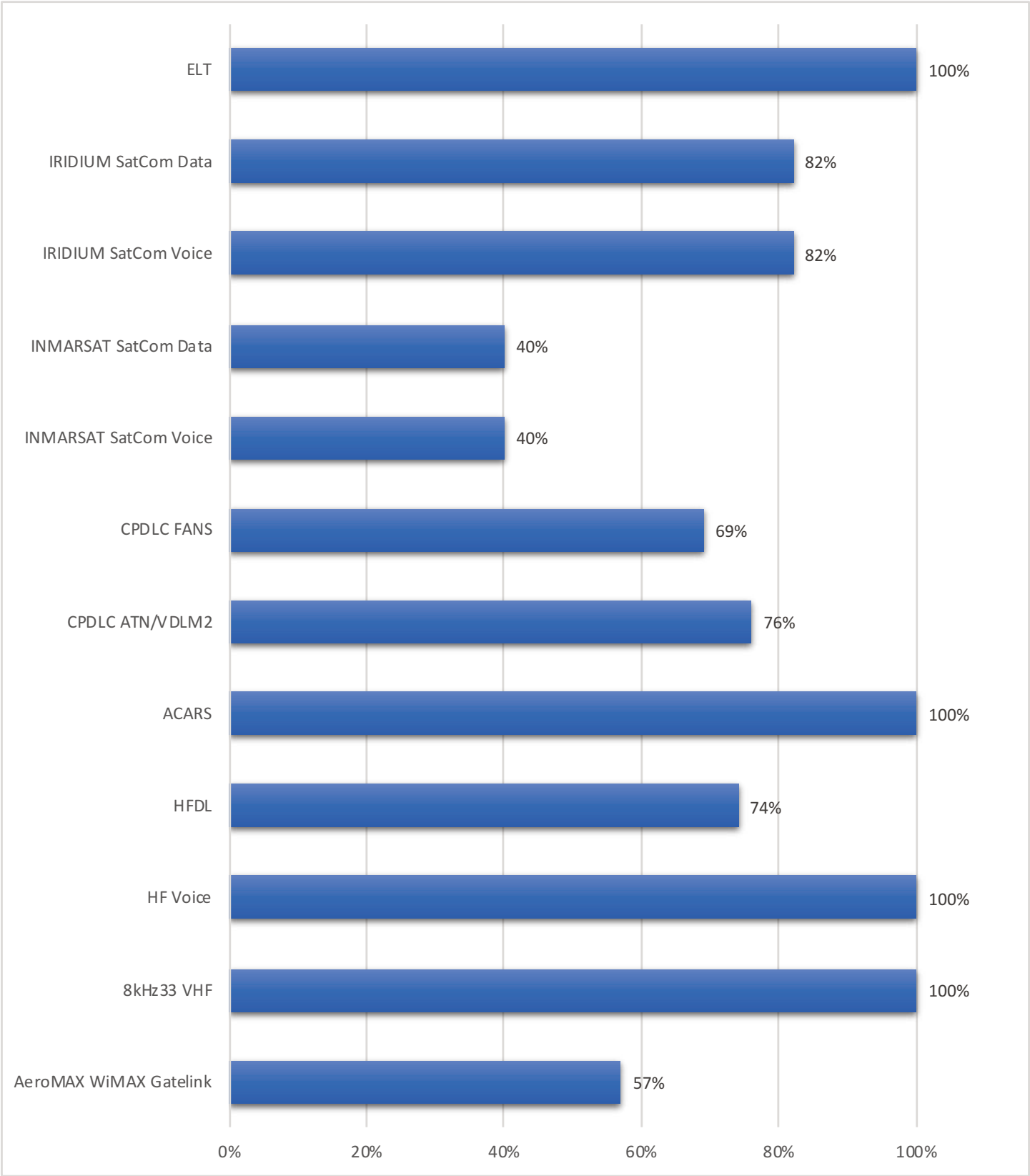


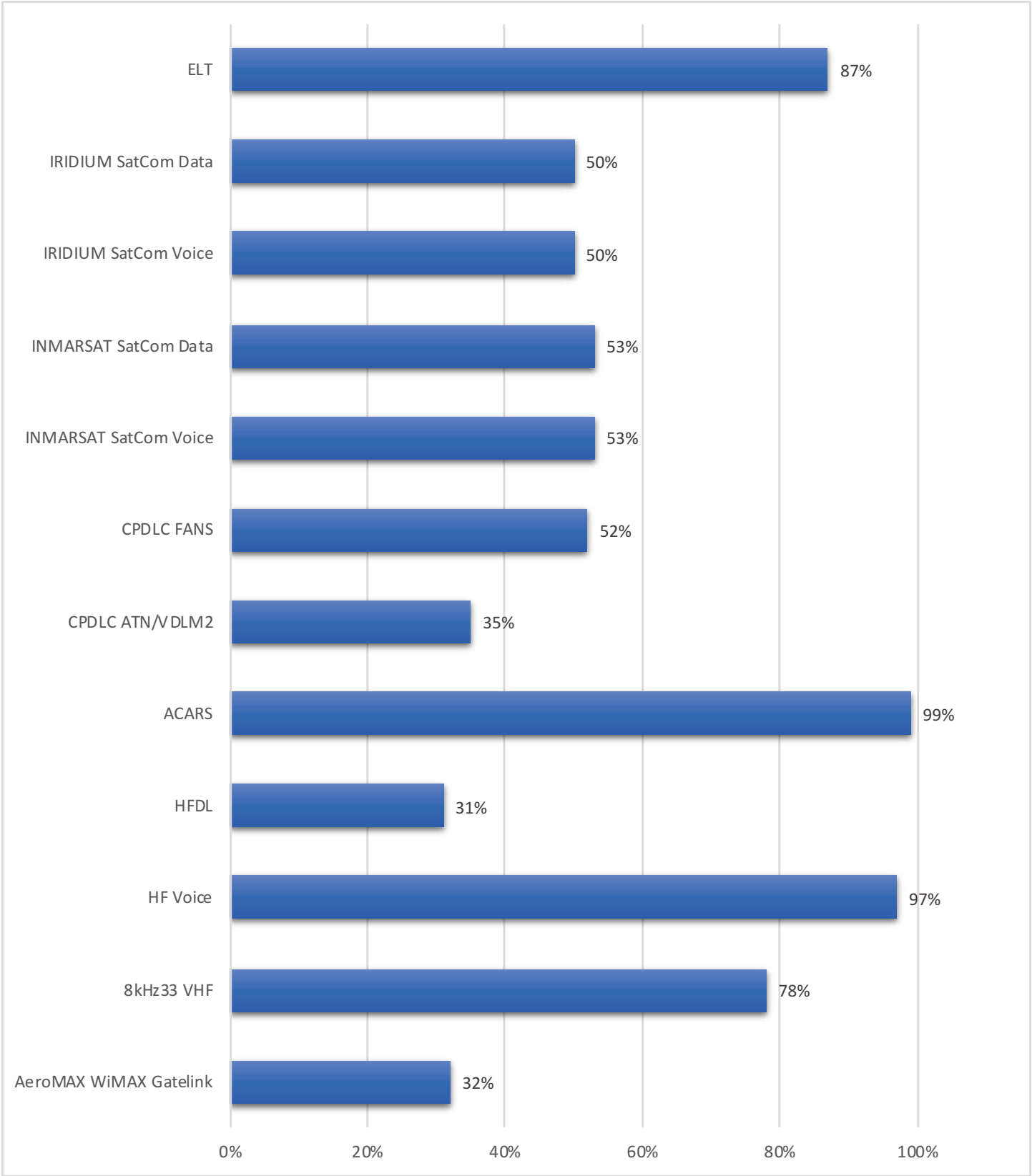
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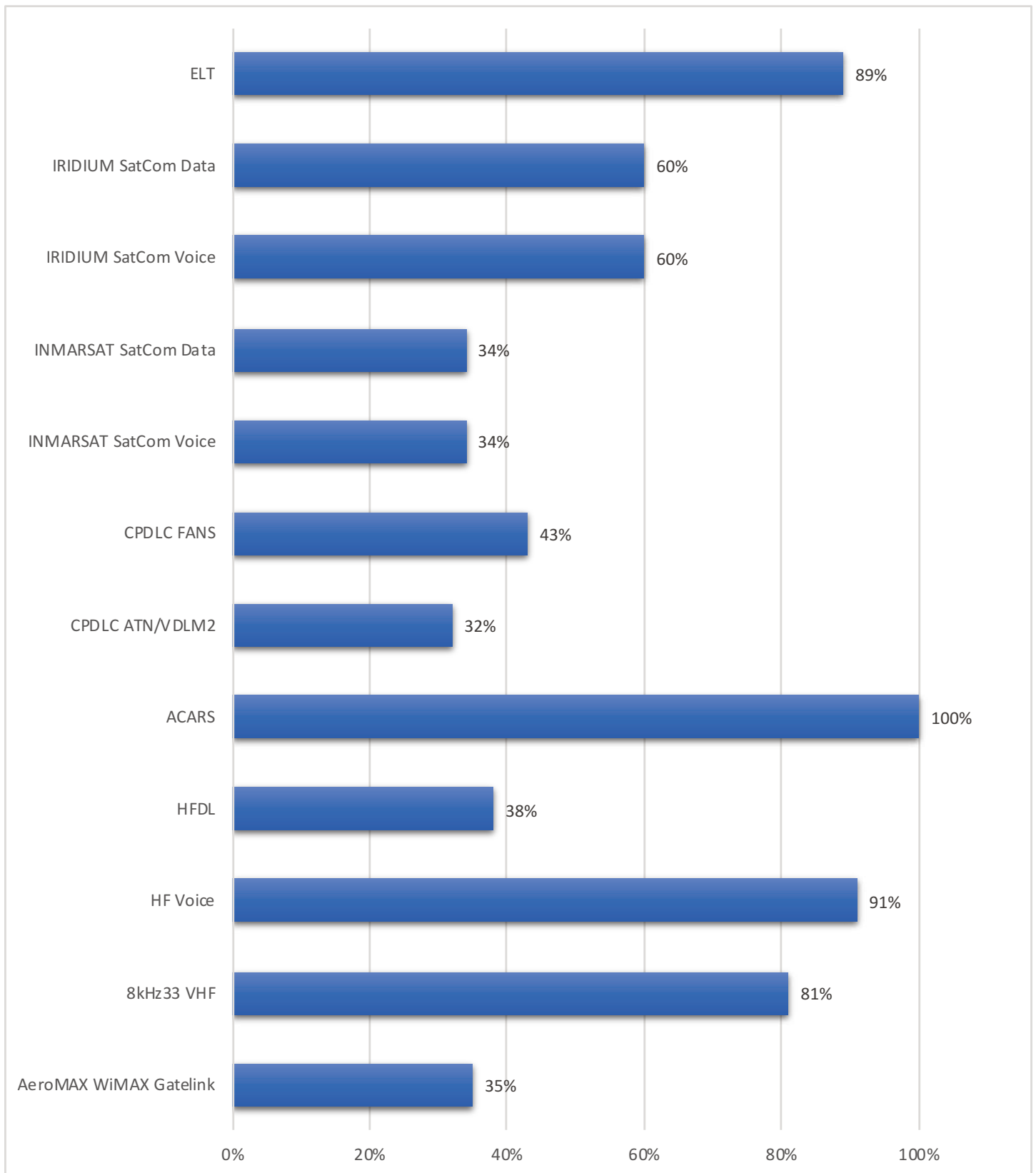




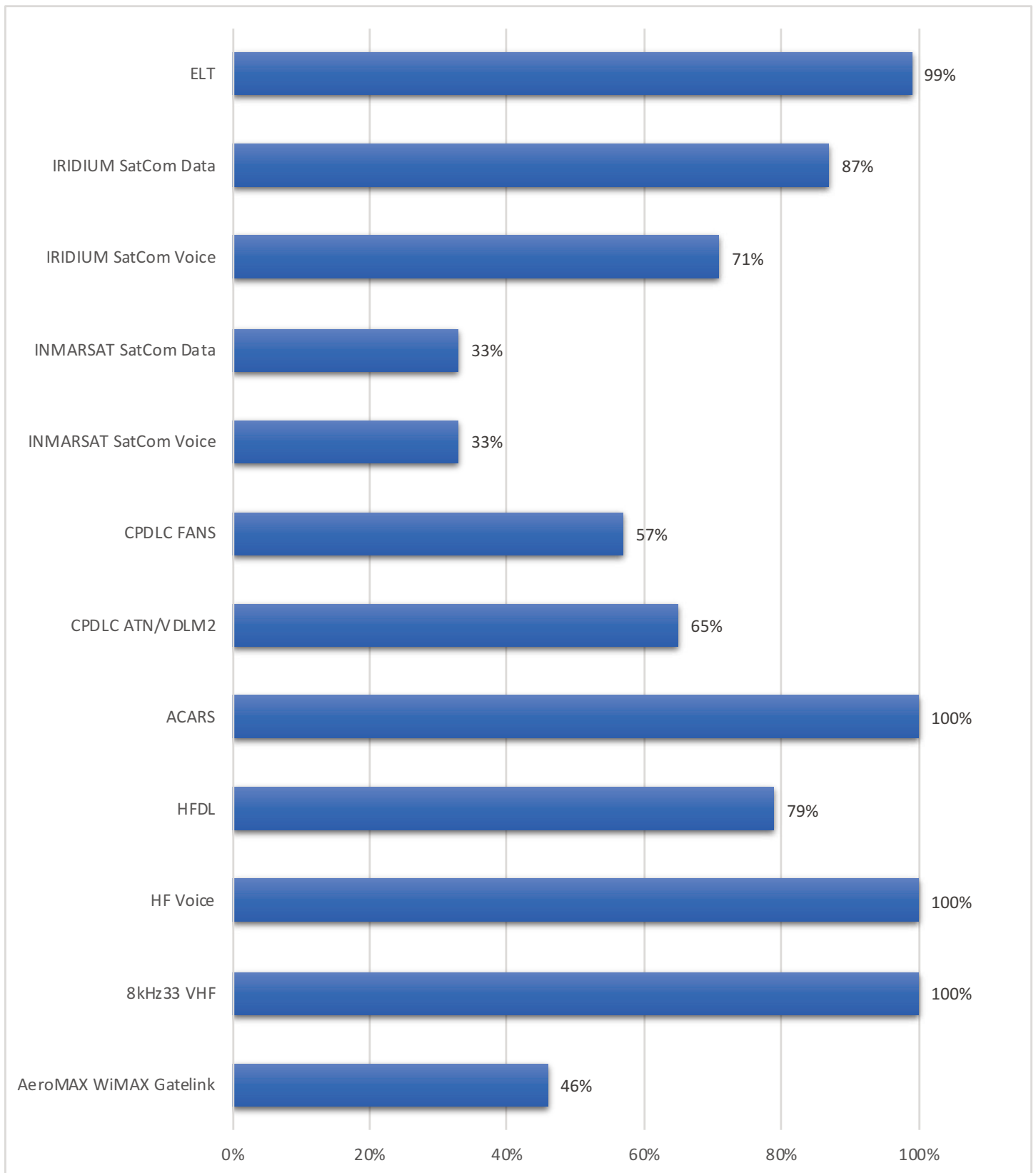


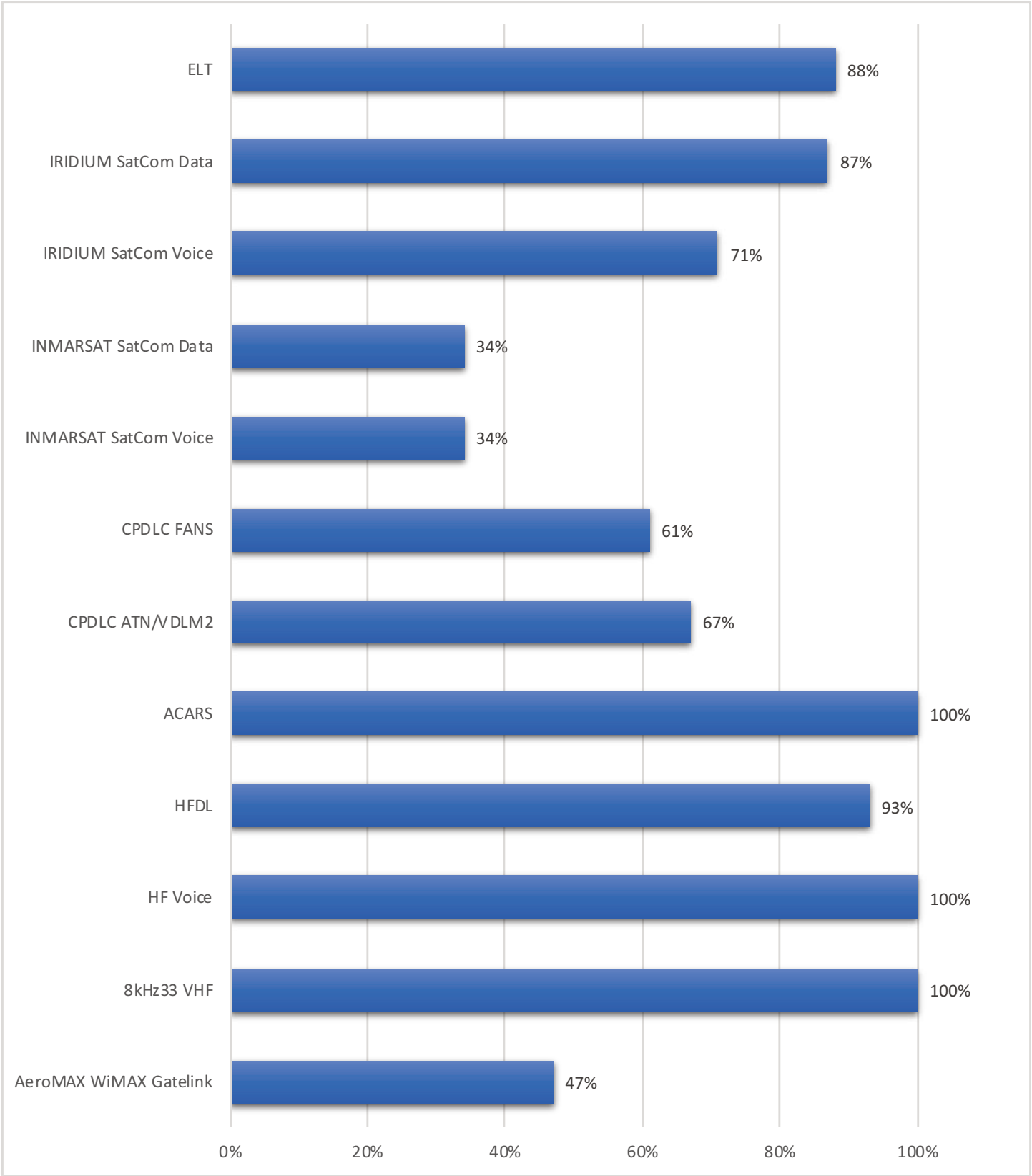


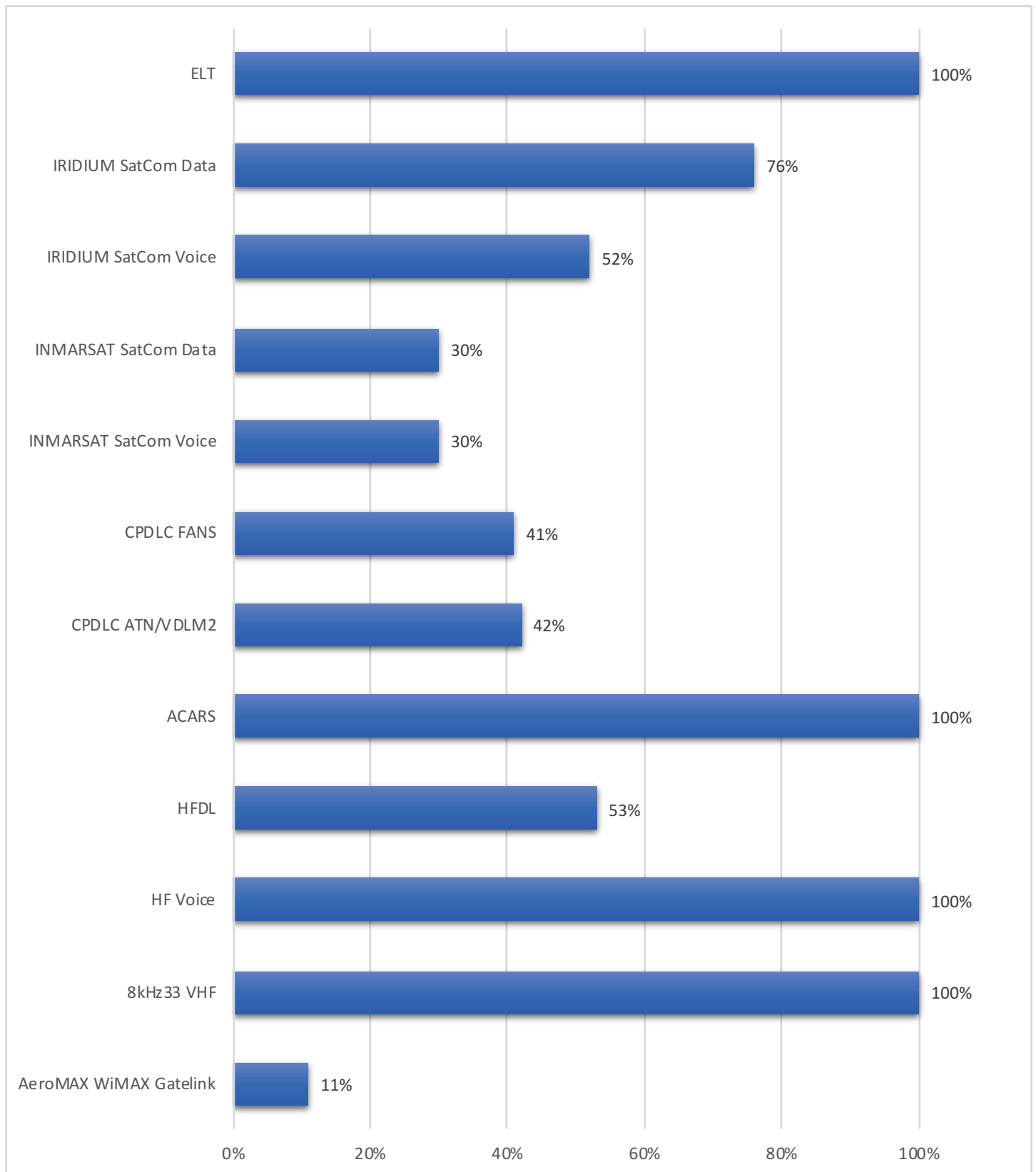
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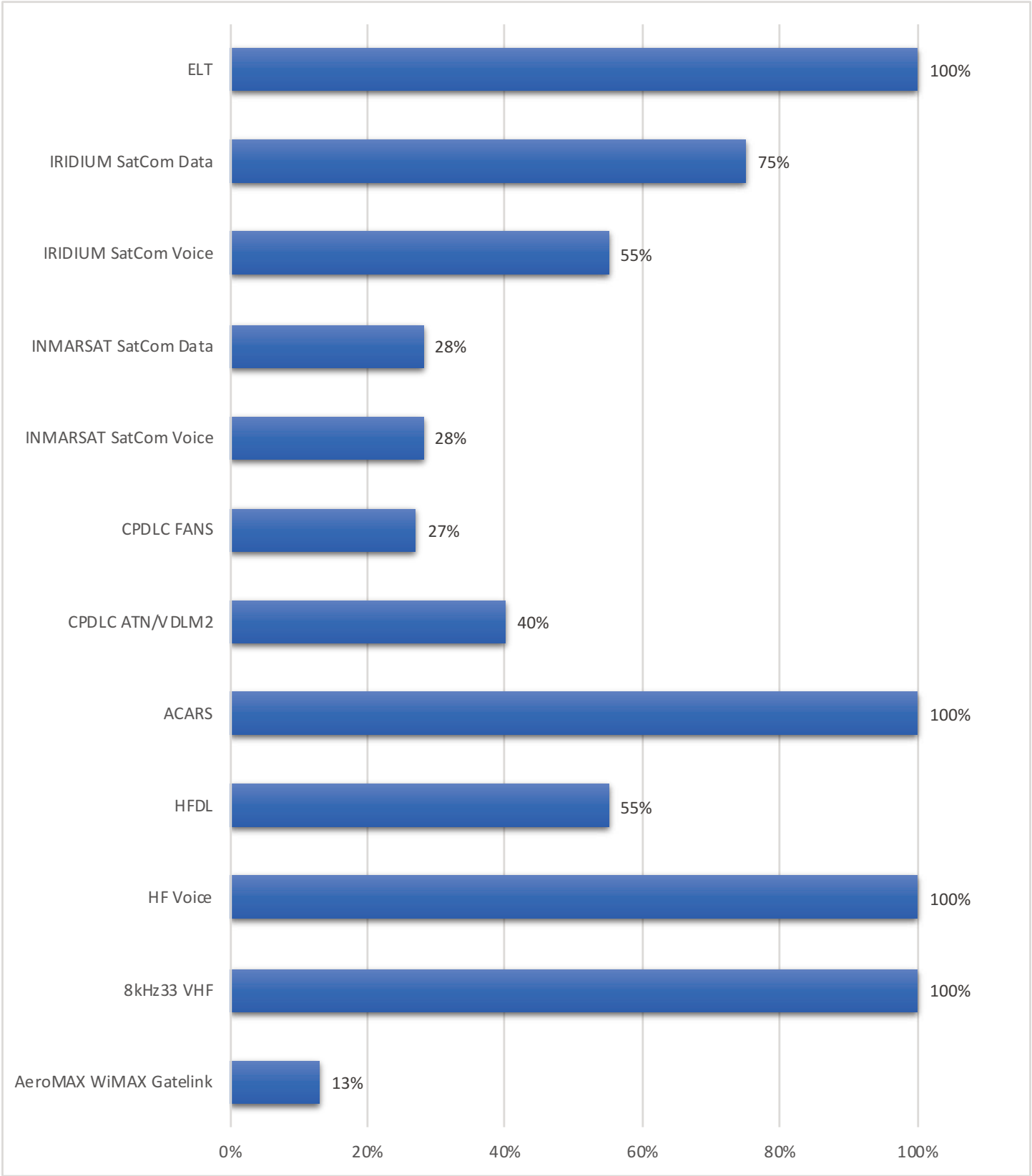


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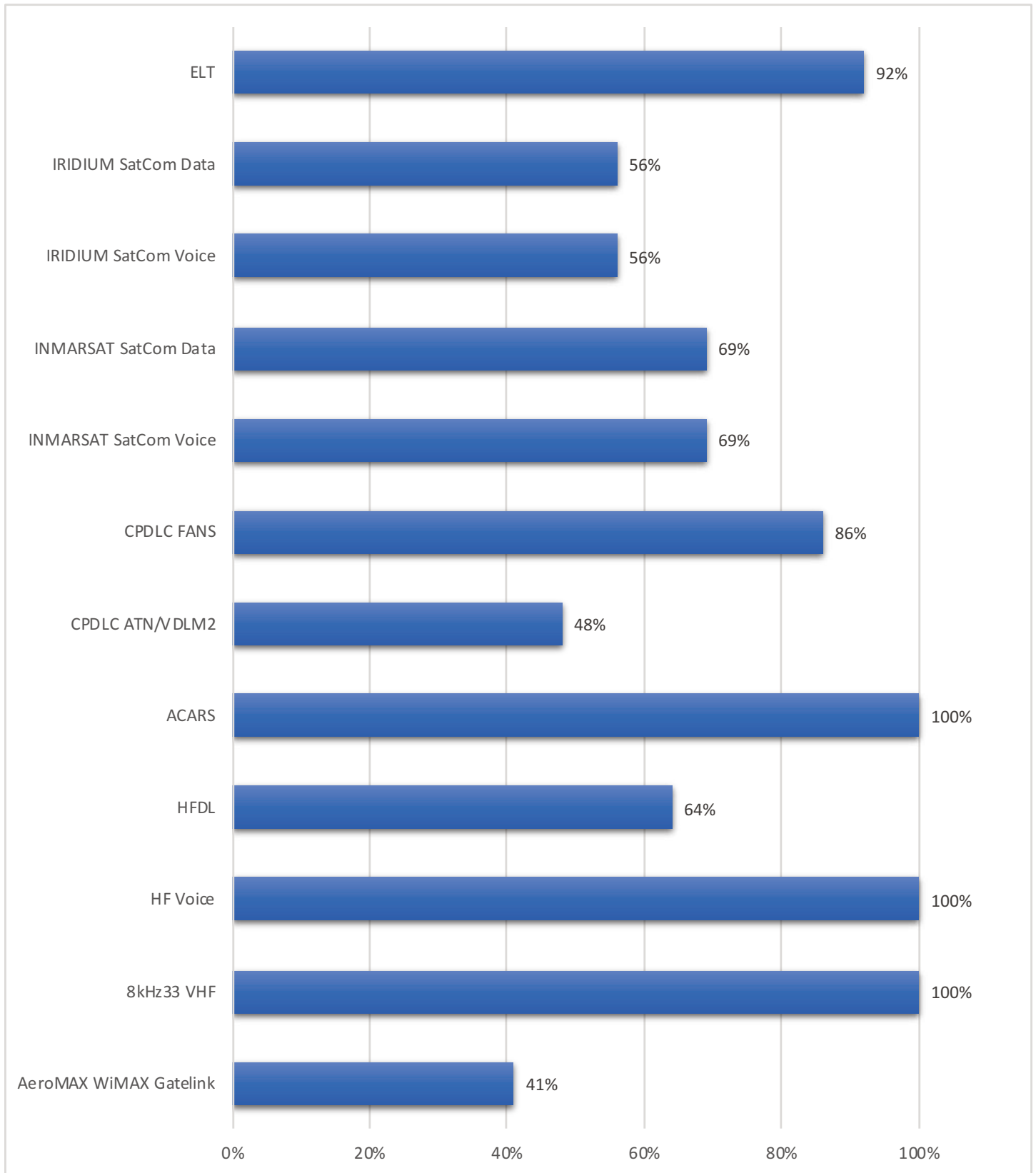


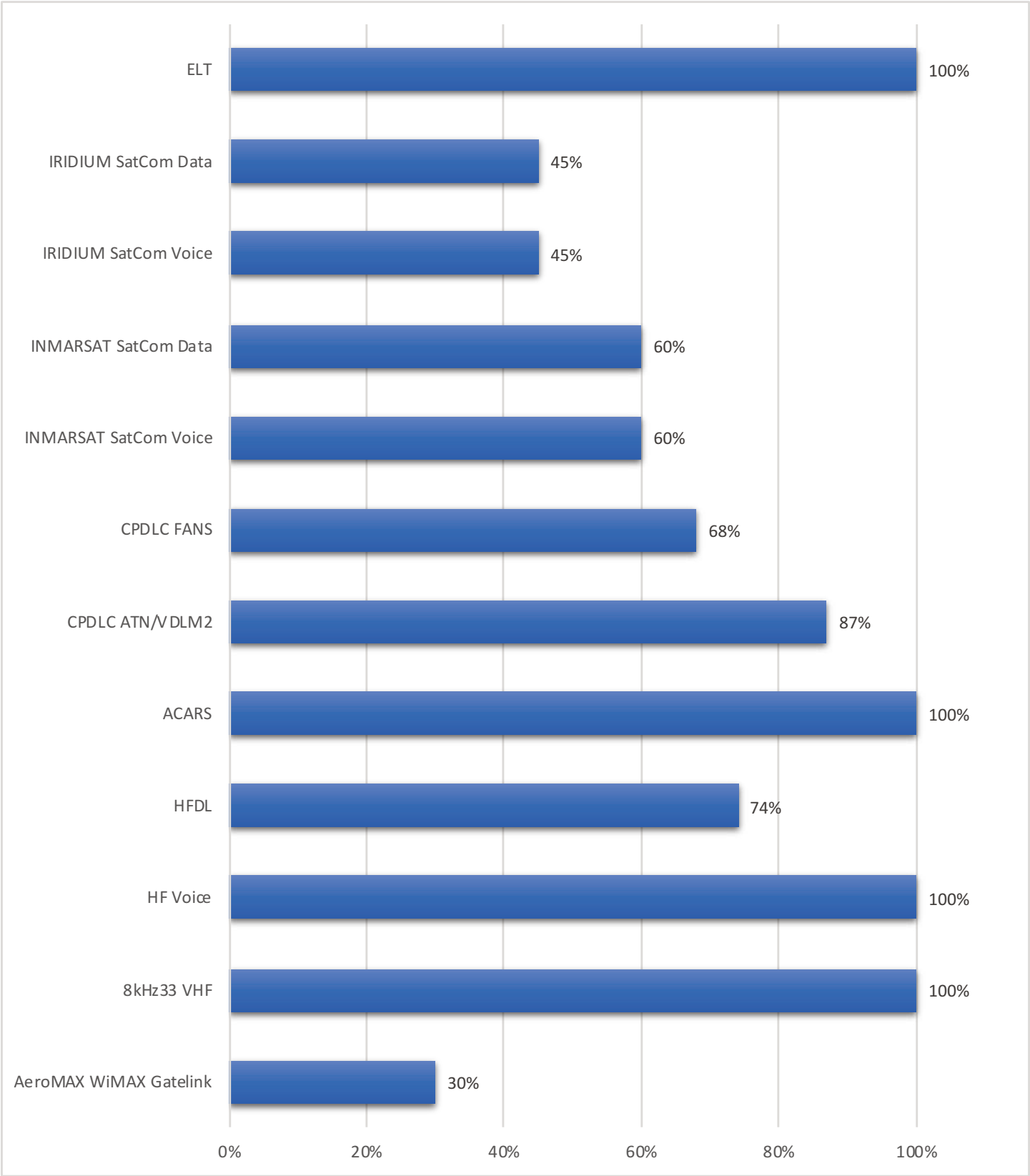


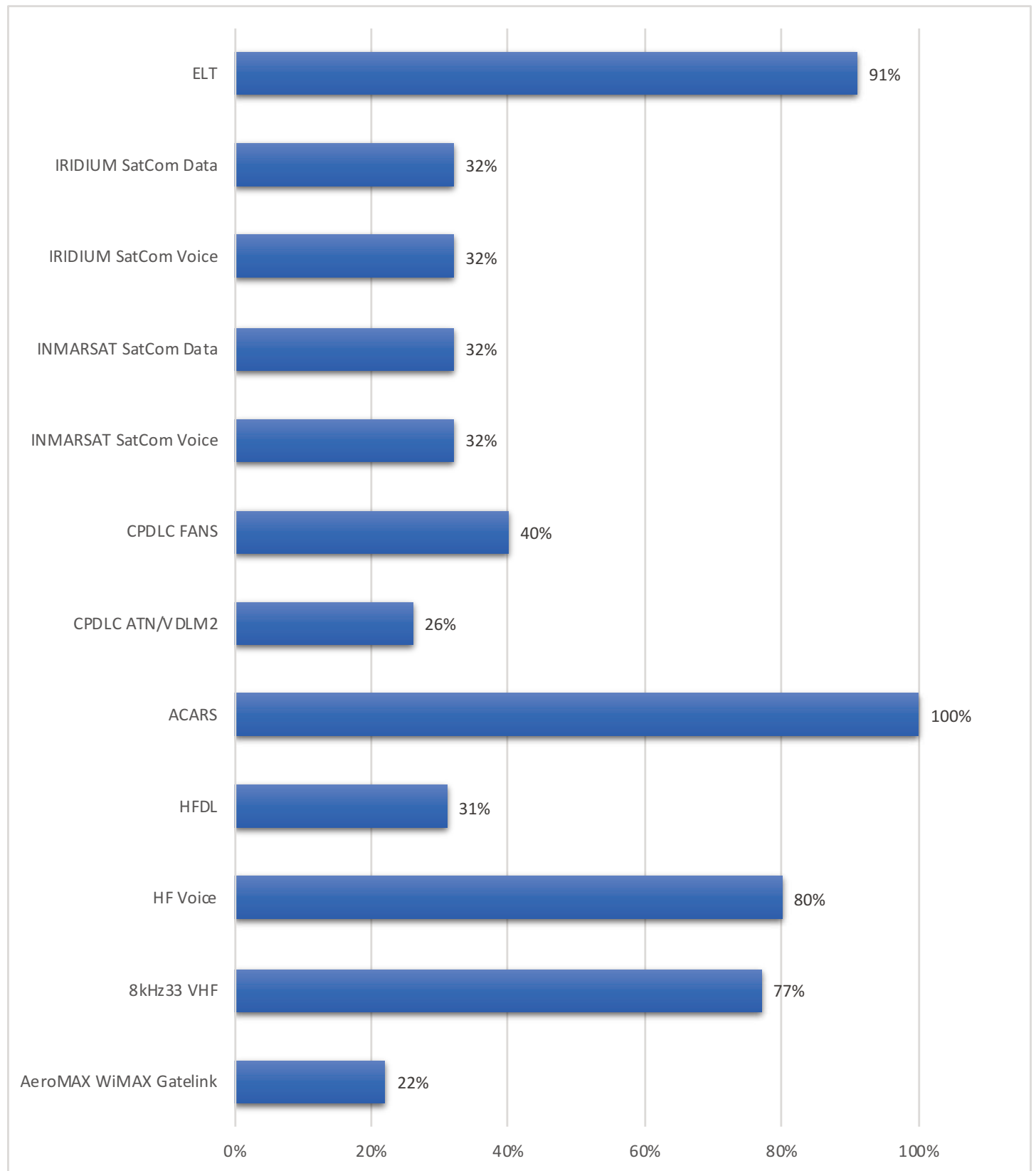




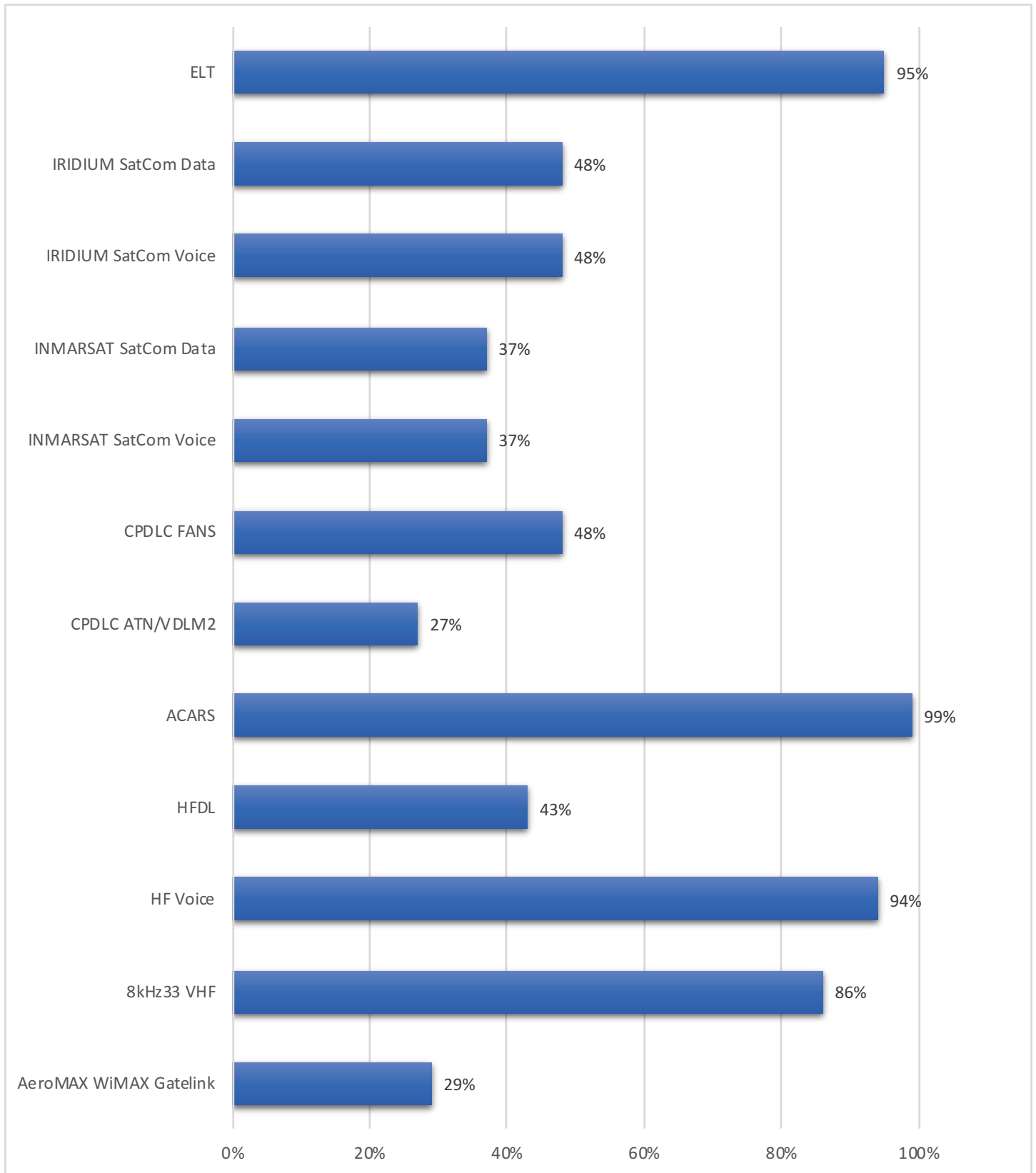
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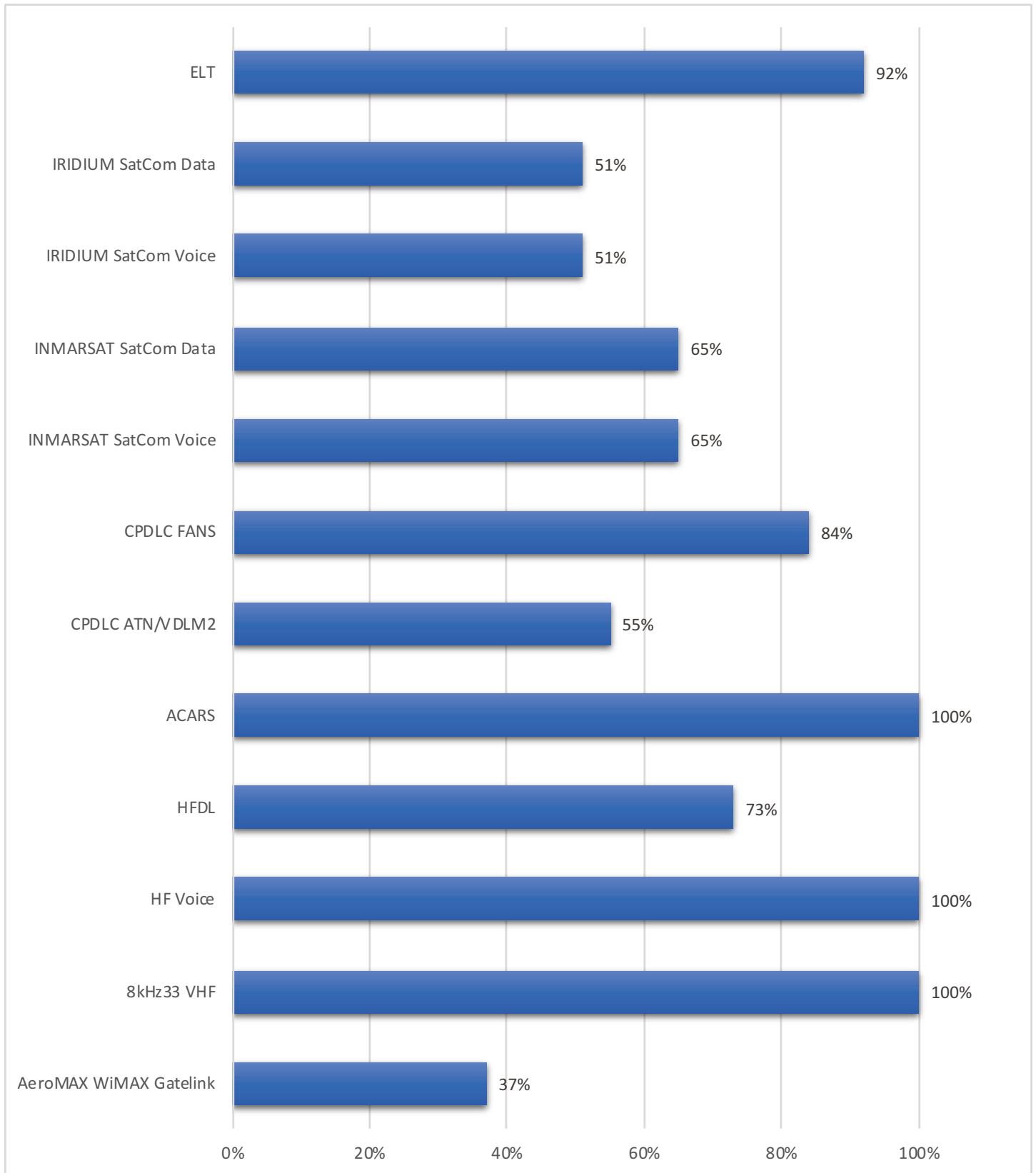


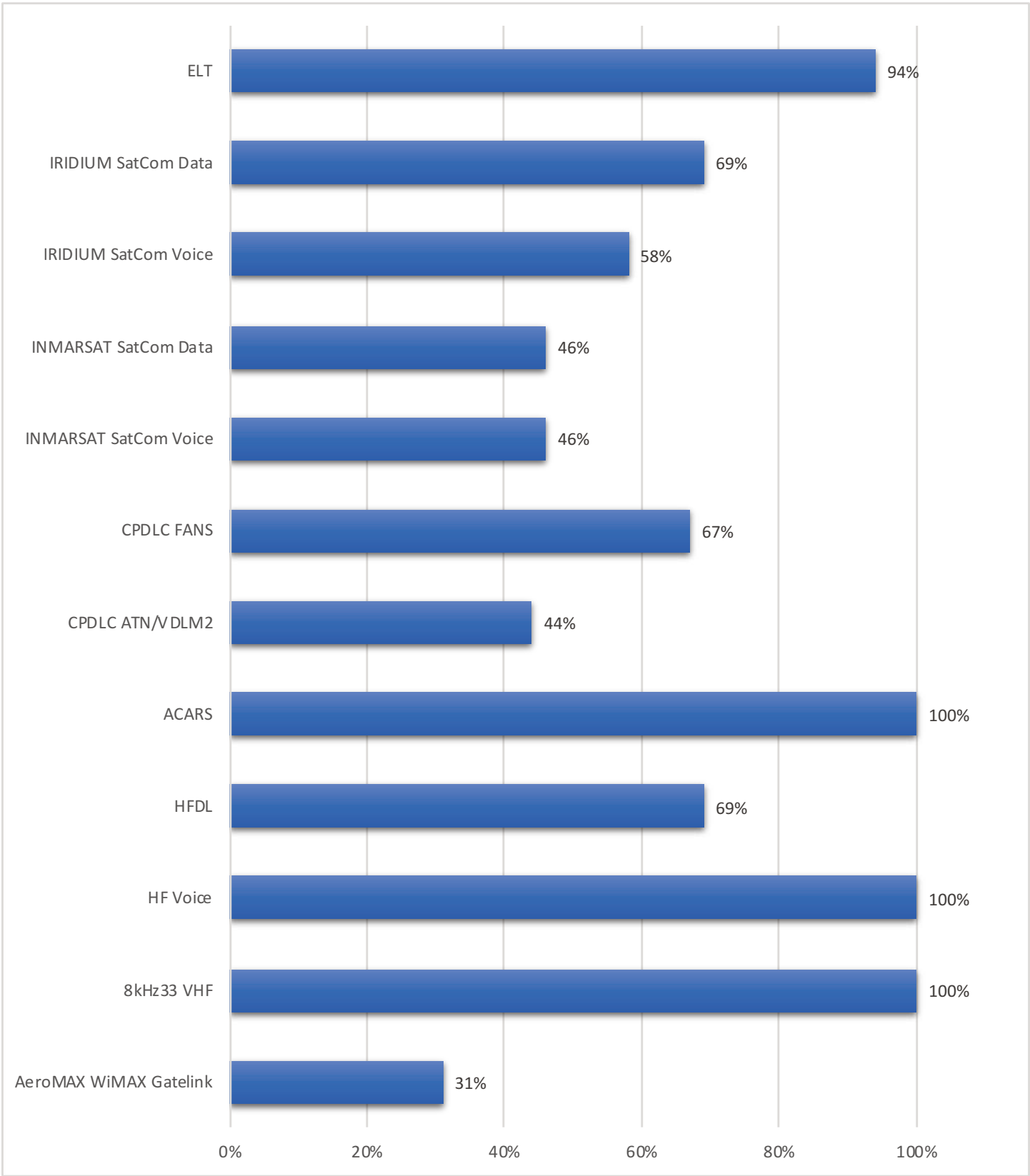


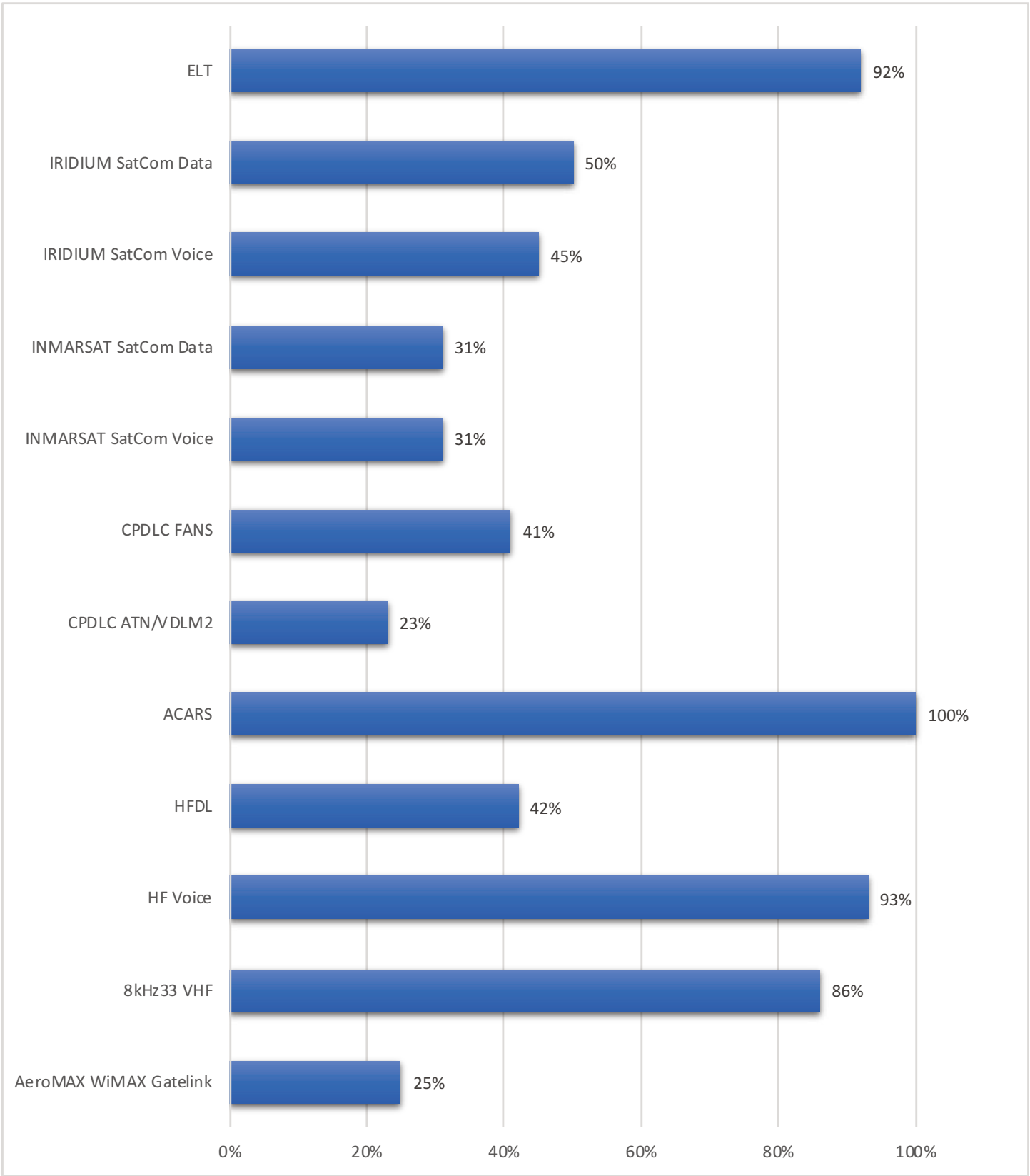
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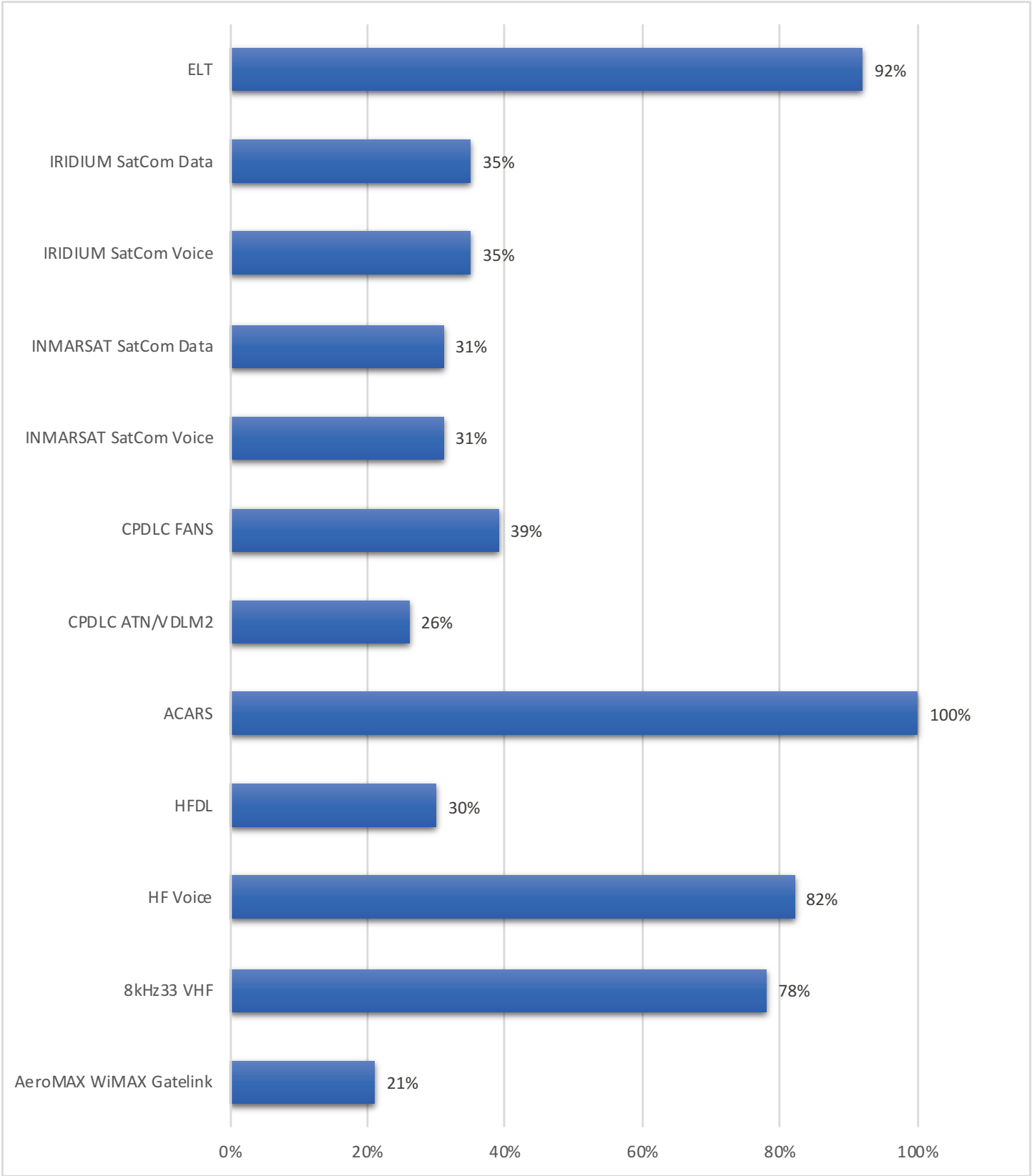


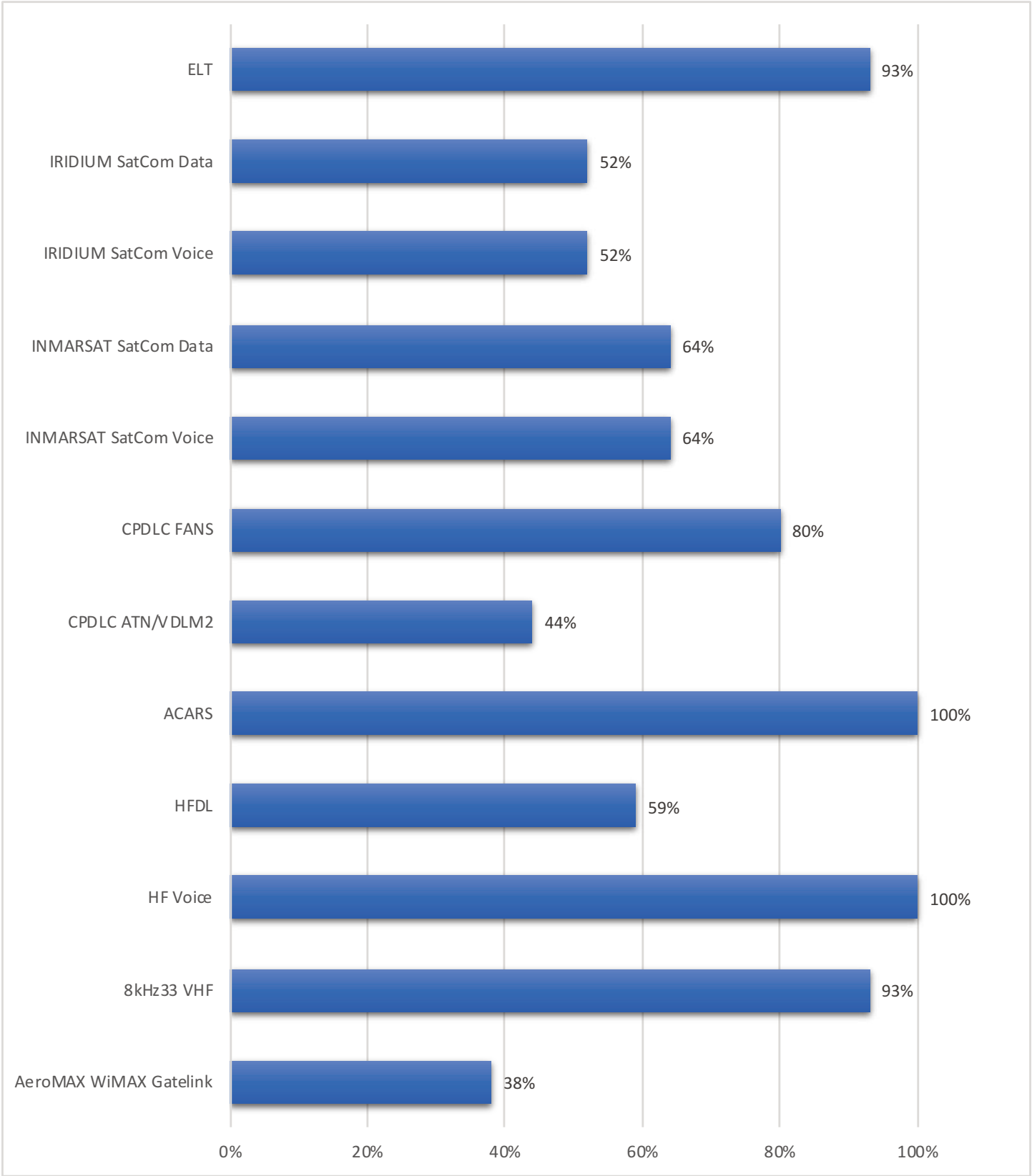
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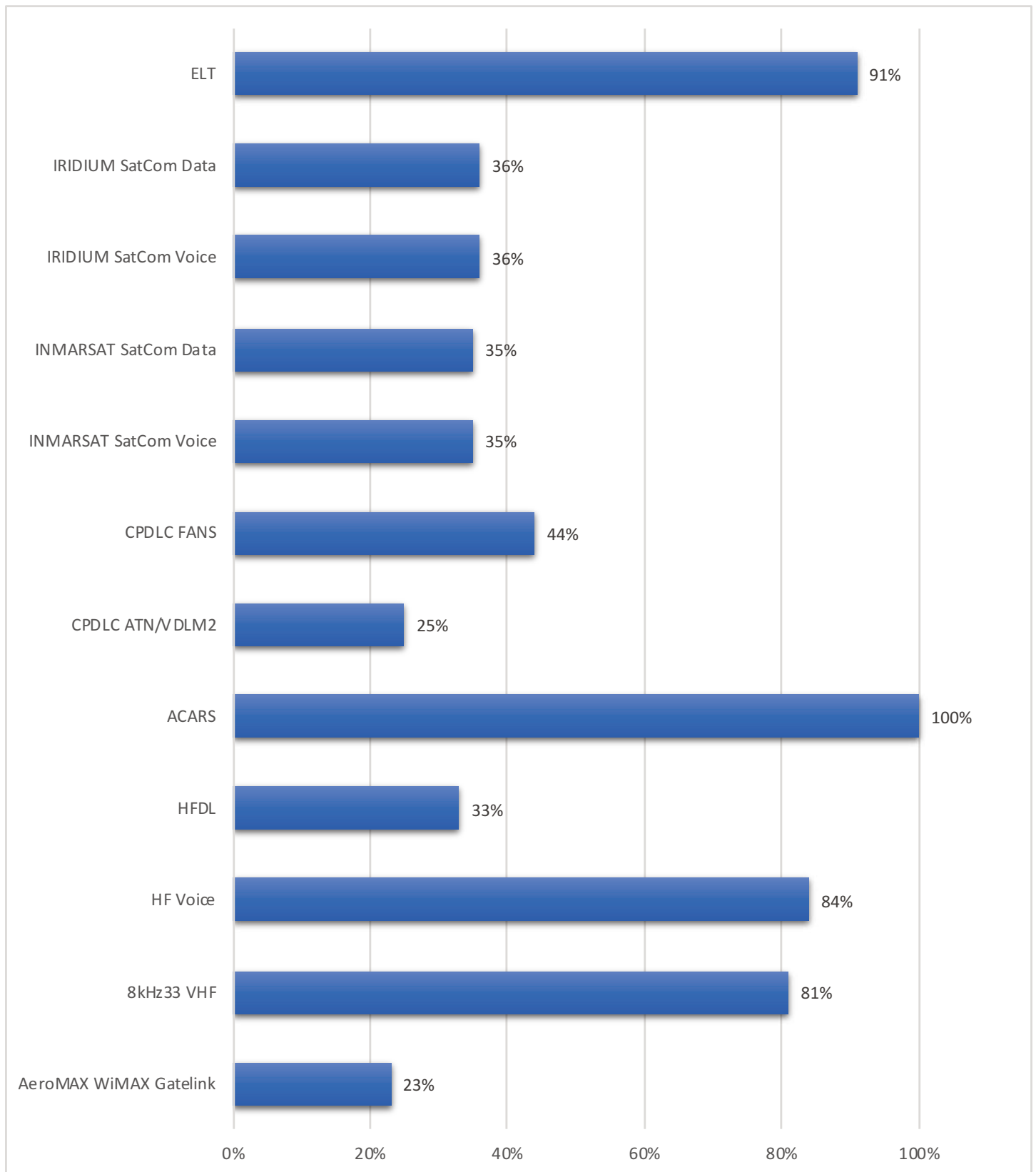




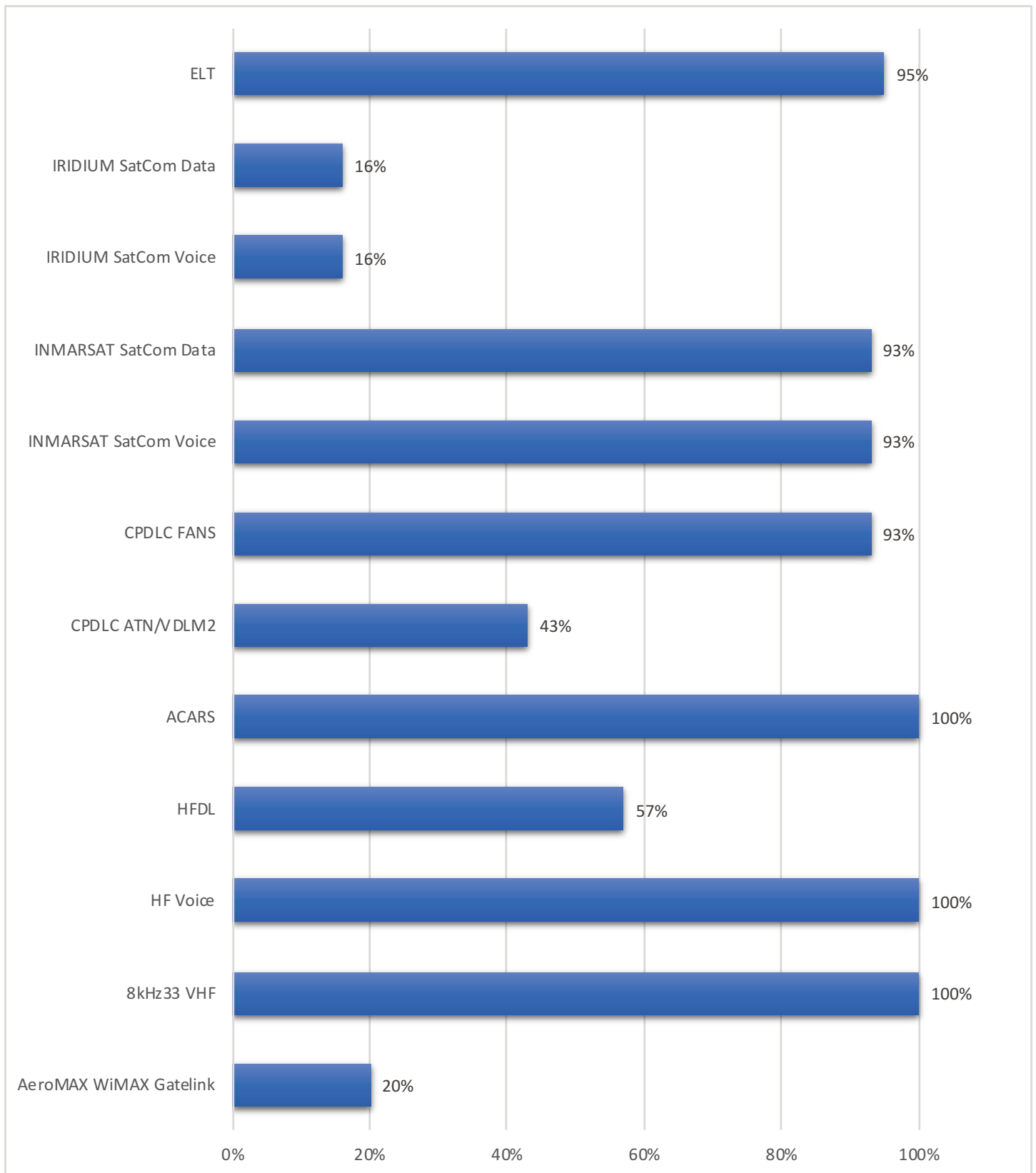


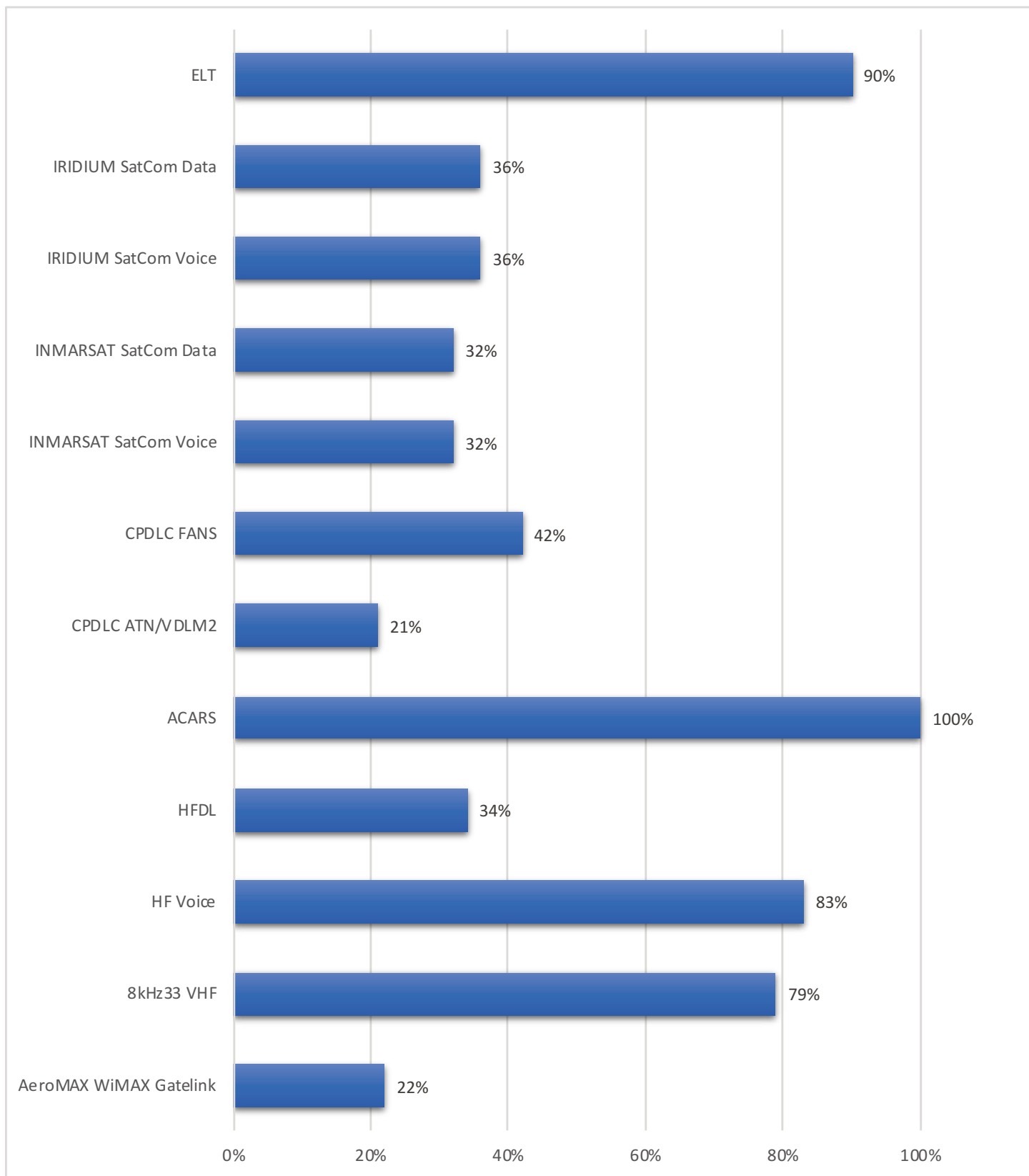


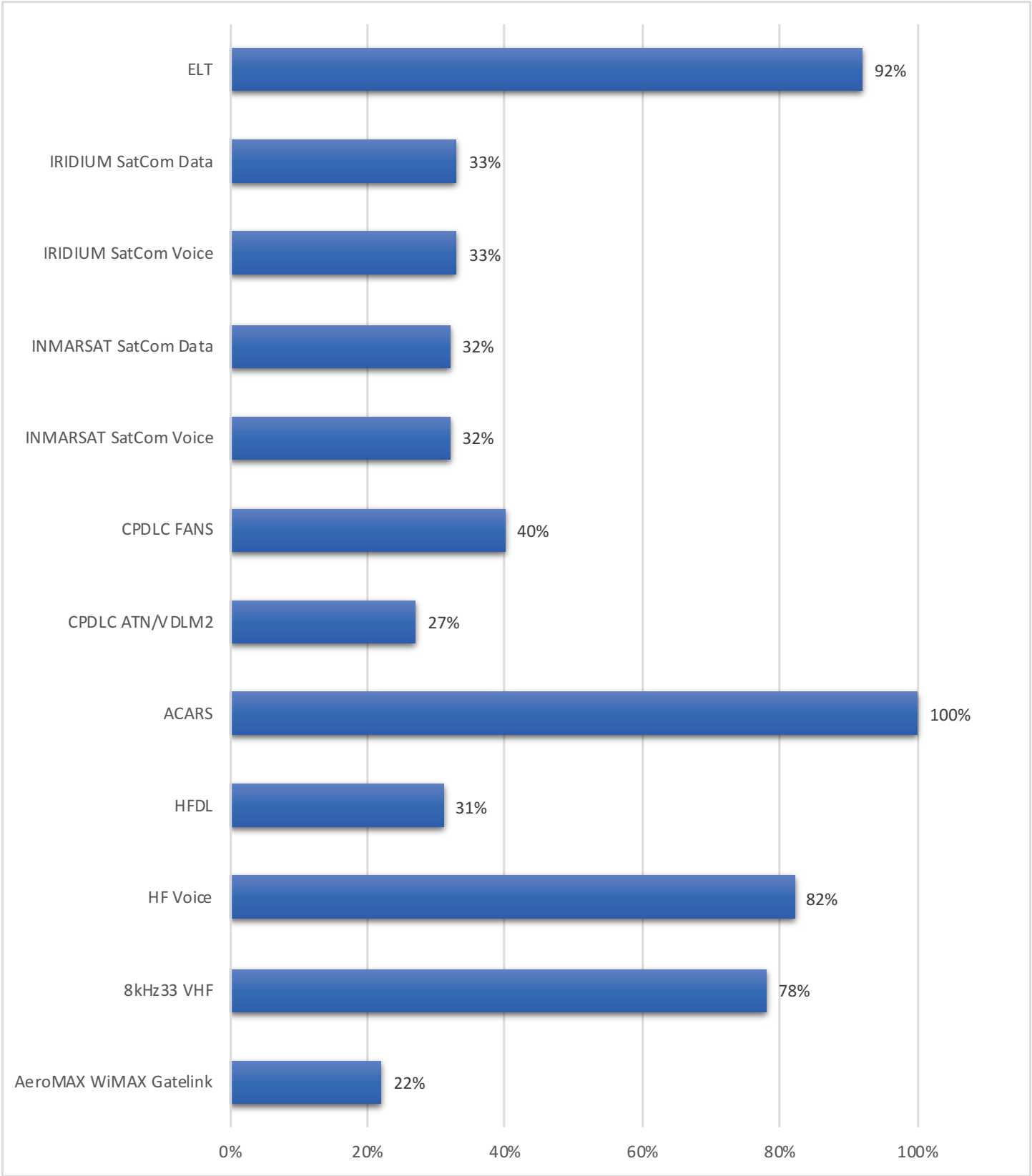


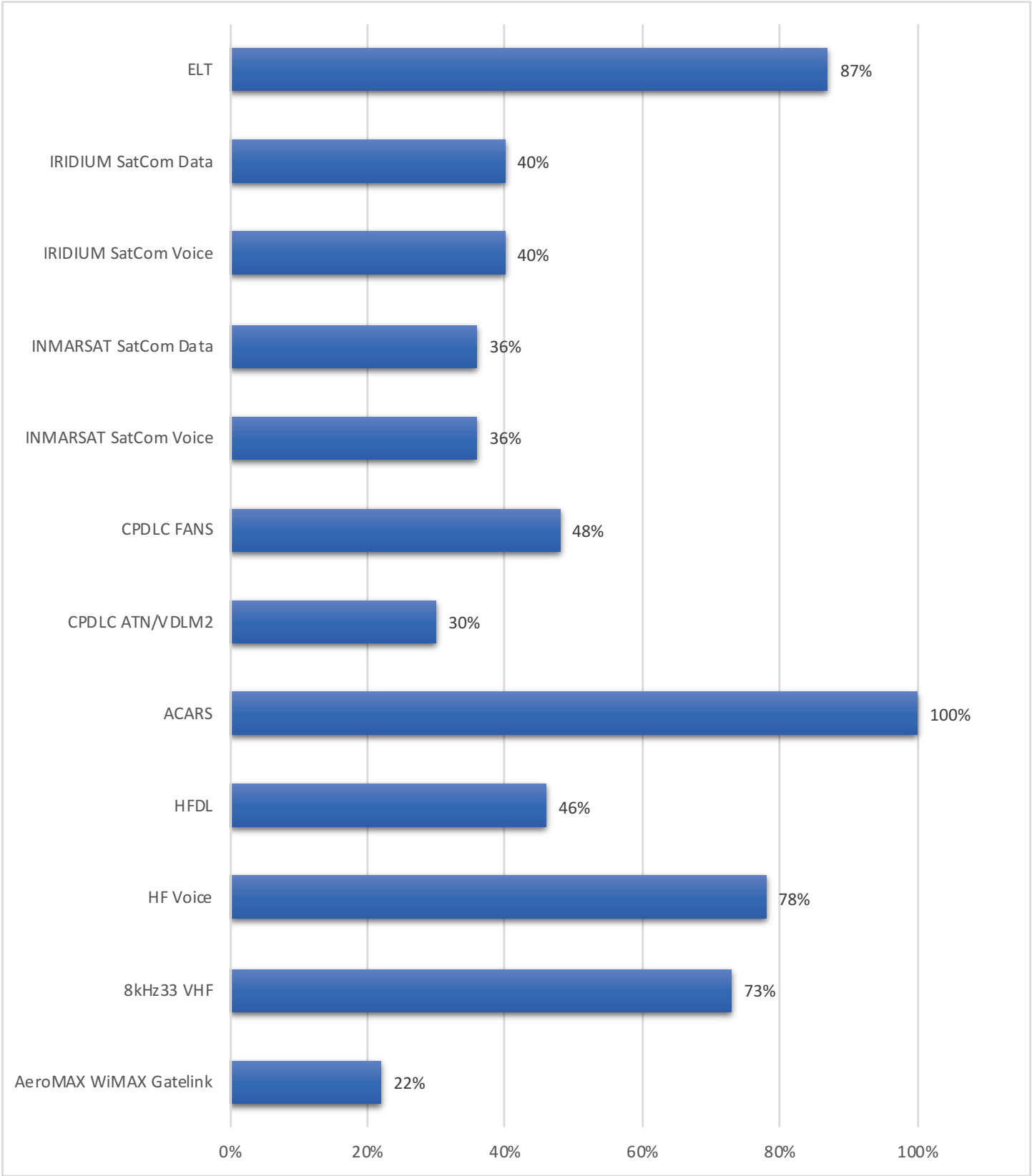


Trans-Polar (North and/or South)









Work In Progress

All Americas Region airspace users including airlines, business, military and general aviation are welcome to contribute to this series of equipage and capability reports.

The associated survey is located here...

Aircraft Equipage and Capability Survey



Based on a survey of 3,375 airframes

Categorized by Flight Information Region (FIR)



IATA Americas Region NAVIGATION

Replacing assumptions with facts

This report is based on unedited airspace user submissions

Refer to statistical note on page 2

CONTRIBUTING AIRSPACE USERS

AEROMEXICO, AEROMEXICO CONNECT, AEROLITORAL, AIR CANADA, AIR CANADA ROUGE, AIR NEW ZEALAND, AIR EUROPA, AVIANCA BRAZIL, AZUL, CONDOR, COPA, DELTA, ETIHAD, FEDEX, GOL, IBERIA, JETBLUE, KLM, LATAM AIRLINES, LIAT, QATAR AIRWAYS, ROYAL JORDANIAN, SAS, SWISS, SWISS GLOBAL, UNITED, UPS.

AIRFRAME TYPES

A306, A310, A319, A320, A321, A330, A332, A333, A343, A346, A359, A388, ATR42, ATR72, B737, B738, B739, B744, B757, B752, B763, B767, B772, B777, B77F, B77L, B77W, B787, B788, B789, DC10, E170, E190, MD11, MD88, MD90.

DISCLAIMER: The information contained in this document is subject to constant review and update in light of continuing airspace user contributions via an on-line airframe equipage and capability survey and/or other sources. No reader should act on the basis of any such information without referring to applicable laws and regulations and/or without taking appropriate professional advice. Although every effort has been made to ensure accuracy, the International Air Transport Association shall not be held responsible for any loss or damage caused by errors, omissions, misprints or misinterpretation of the contents hereof. Furthermore, the International Air Transport Association expressly disclaims any and all liability to any person or entity in respect of anything done or omitted, and the consequences of anything done or omitted by any such person or entity, in reliance on the contents of this publication.



Data compilation date: 1st September 2018

Statistical Note

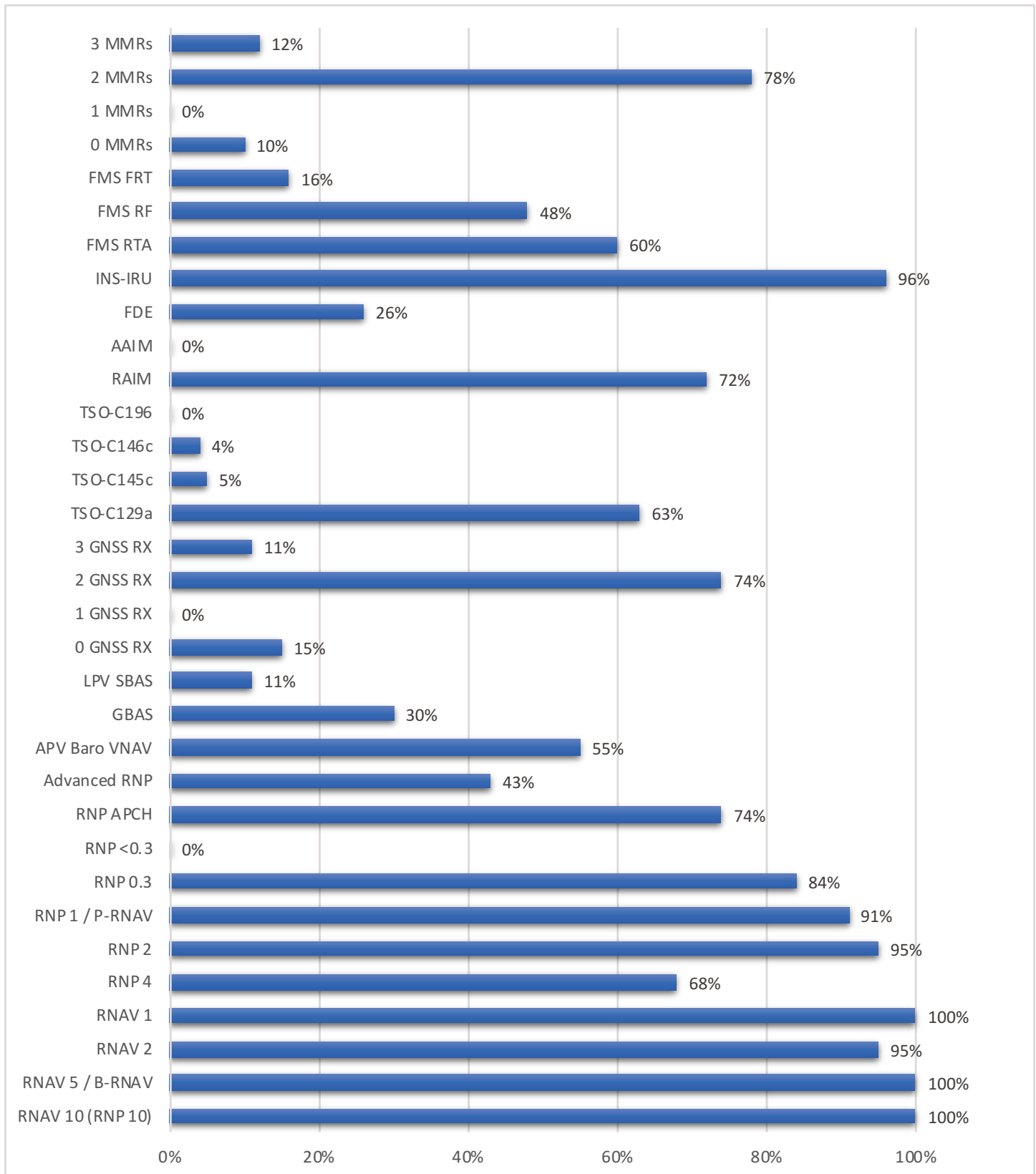
In a limited number of cases, airspace users reported capabilities such as SBAS without specifying the associated navigation source TSO. The capability to use SBAS was determined to be the overriding consideration and recorded as such. In other instances, multiple standards (TSOs) were listed for a navigation capability when referring to a single fleet. These facts were unaltered for the purposes of this report.

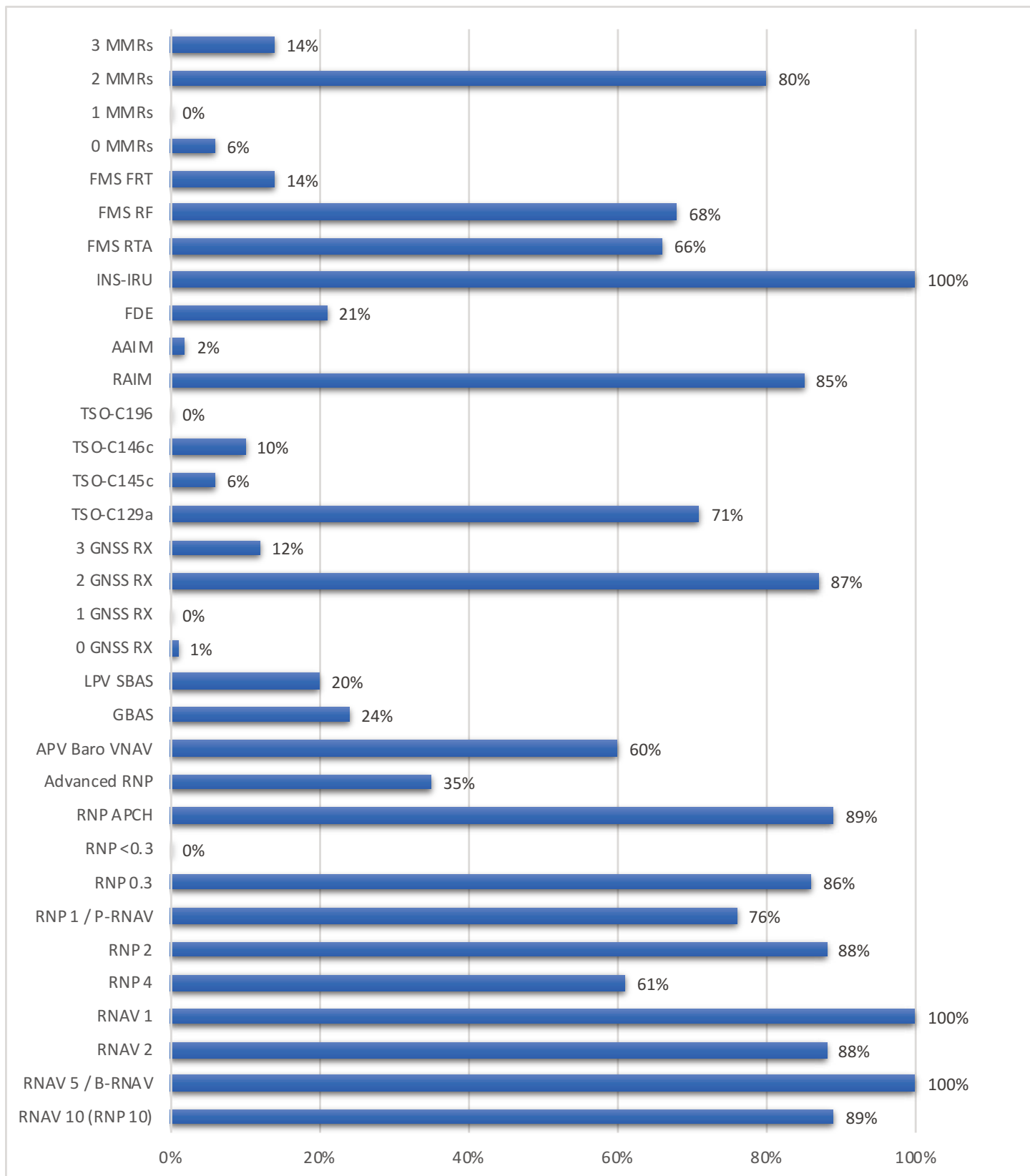
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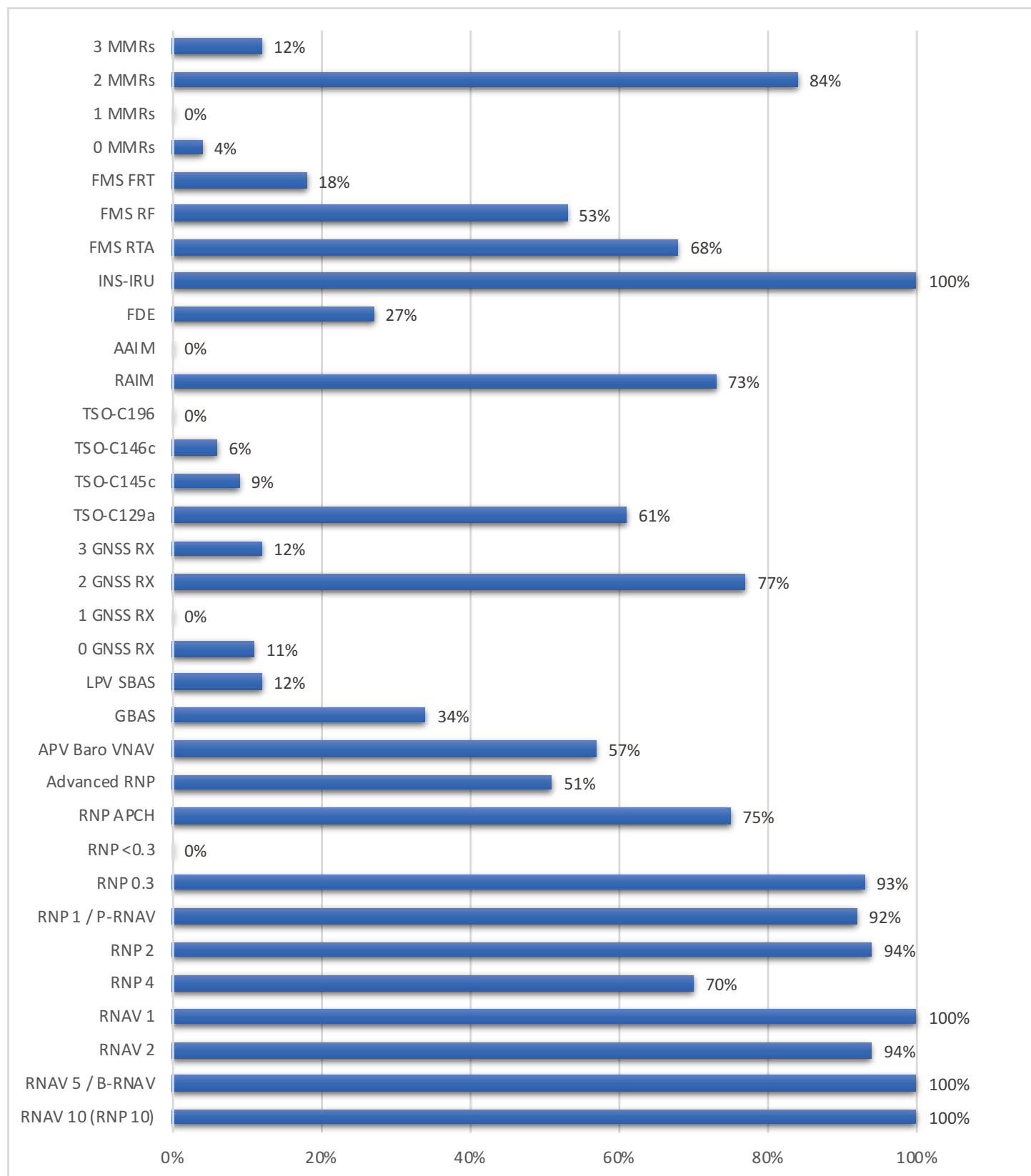
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Safety and Flight Operations Department
IATA Americas Region
703 Waterford Way, Suite 600
Miami, Florida 33126
USA

ocarrollk@iata.org

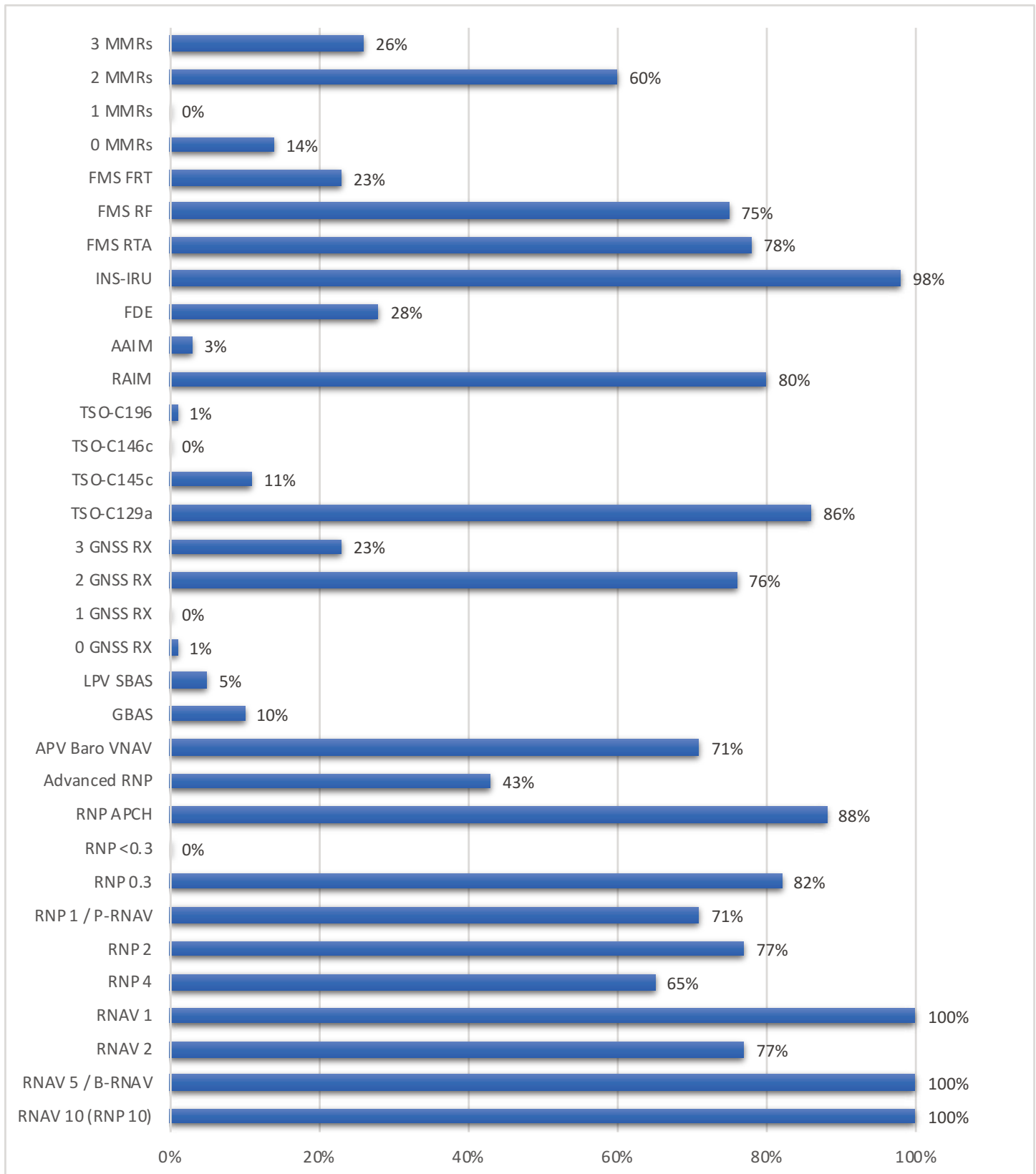
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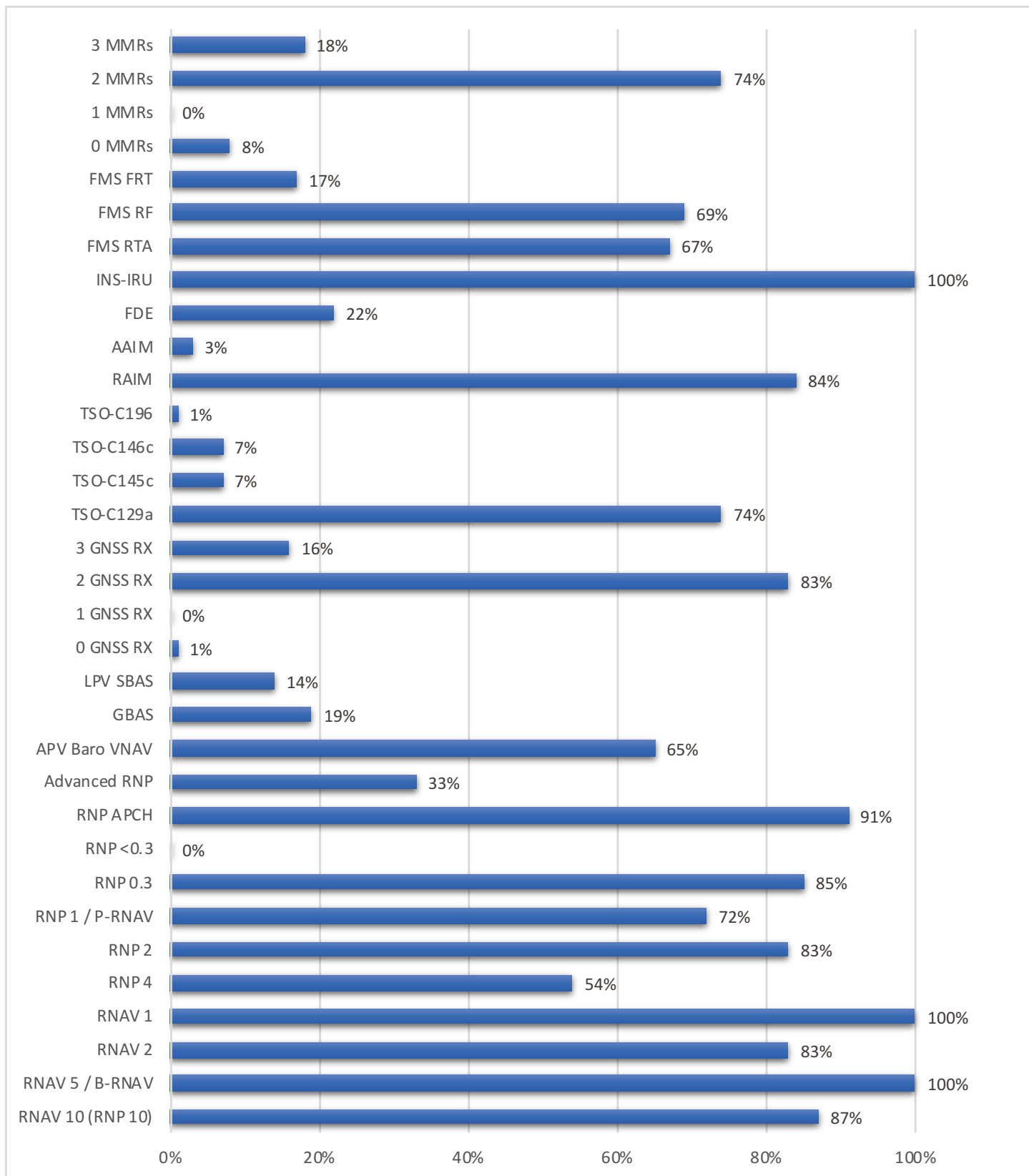


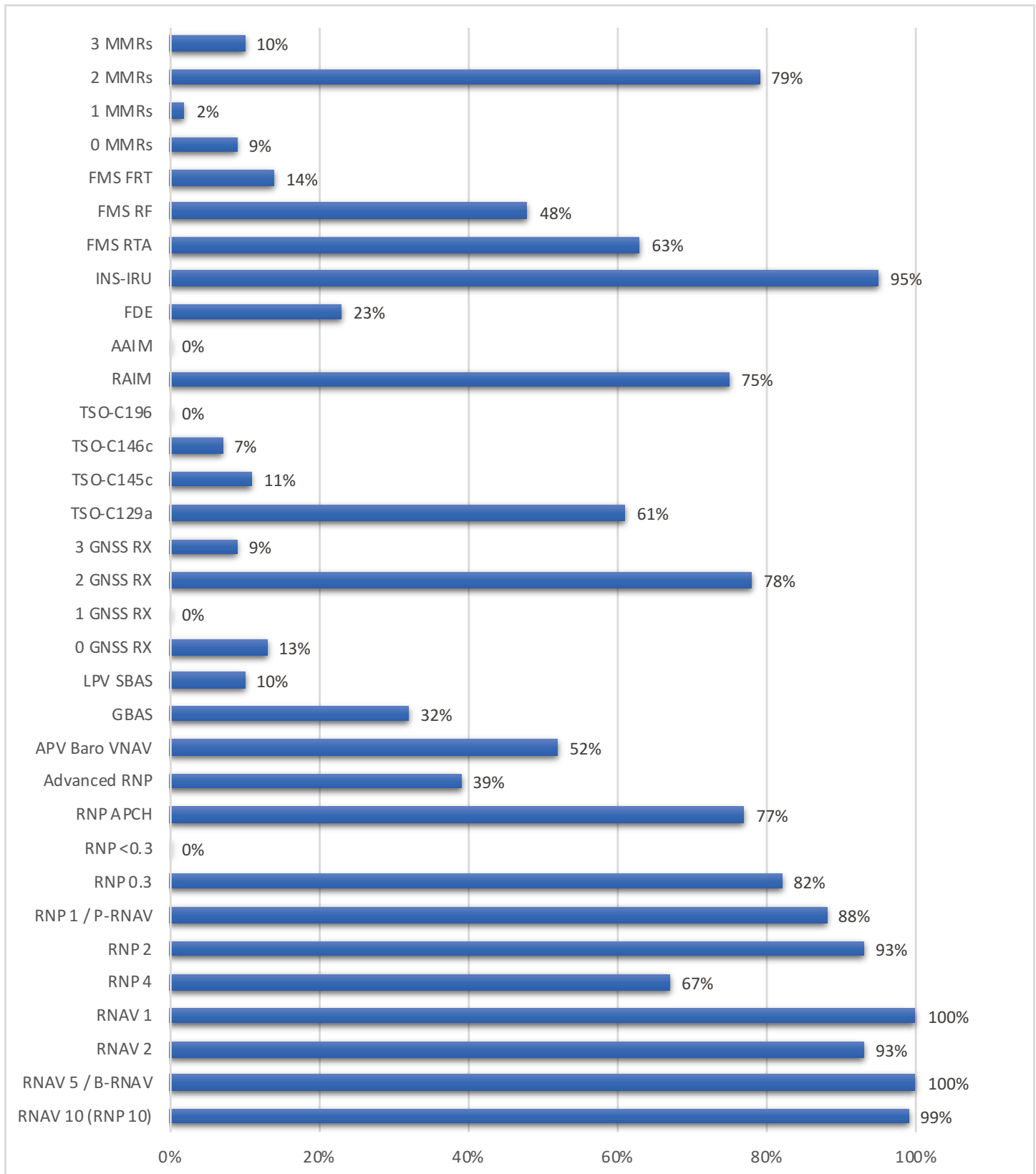




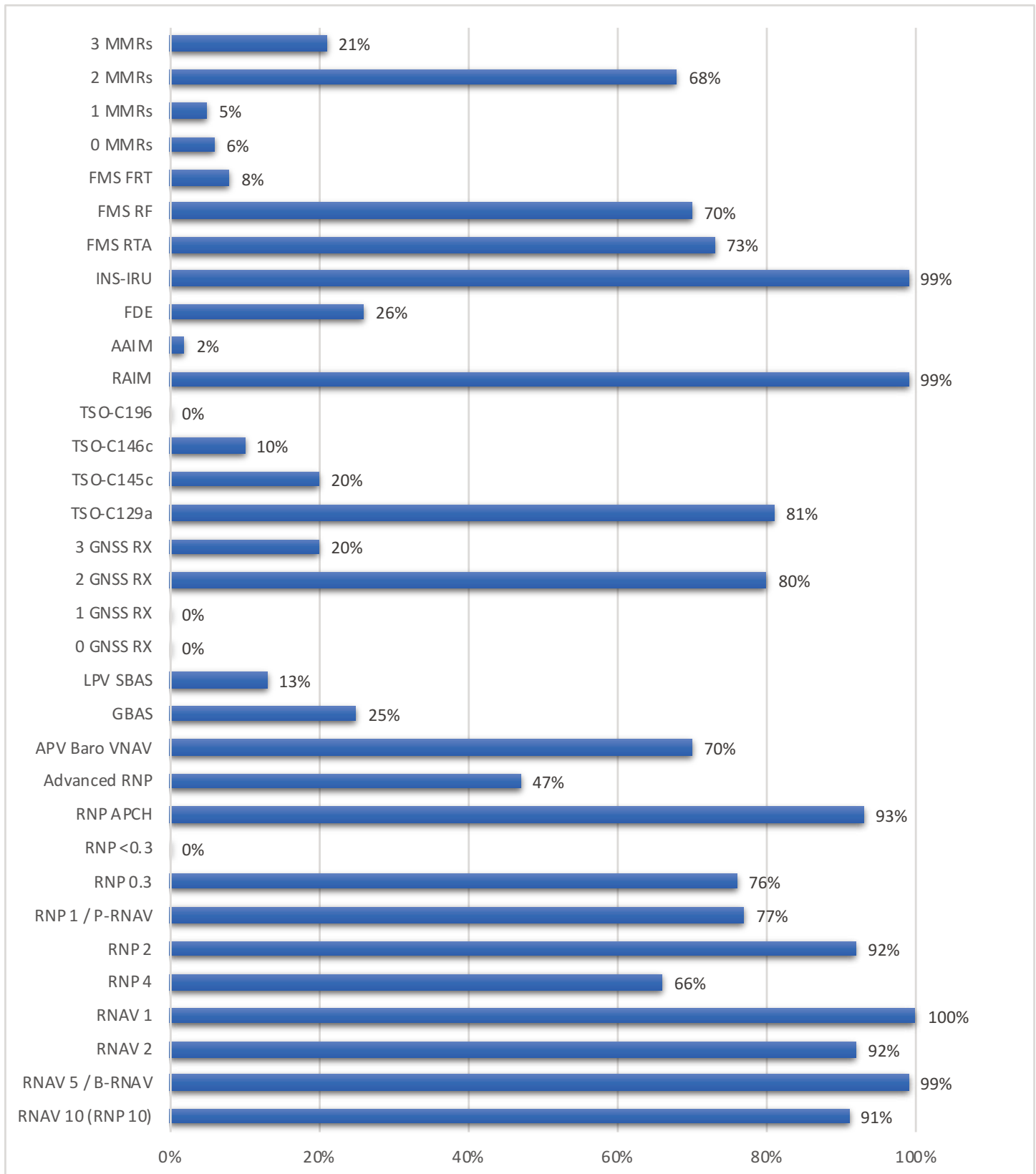
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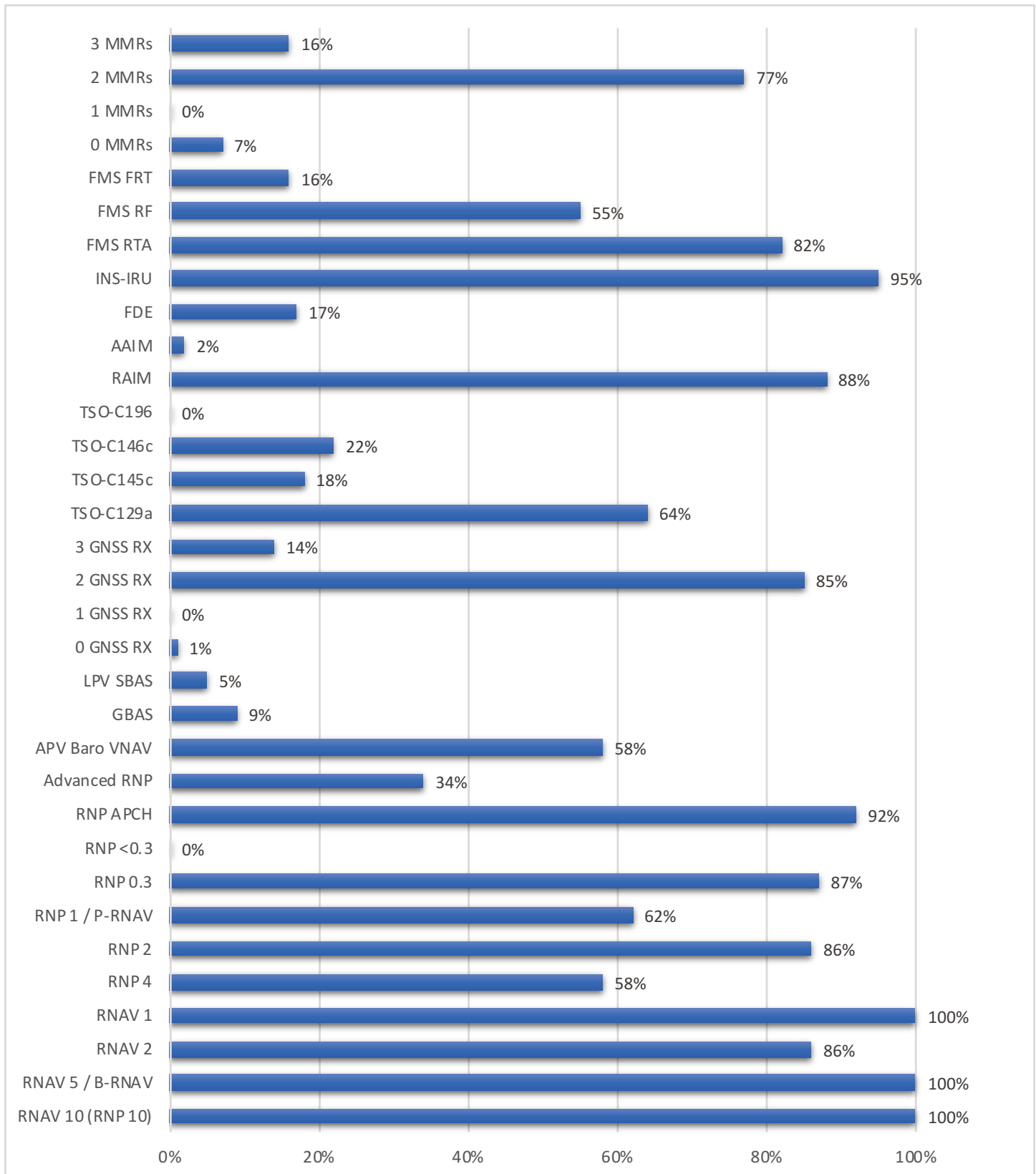




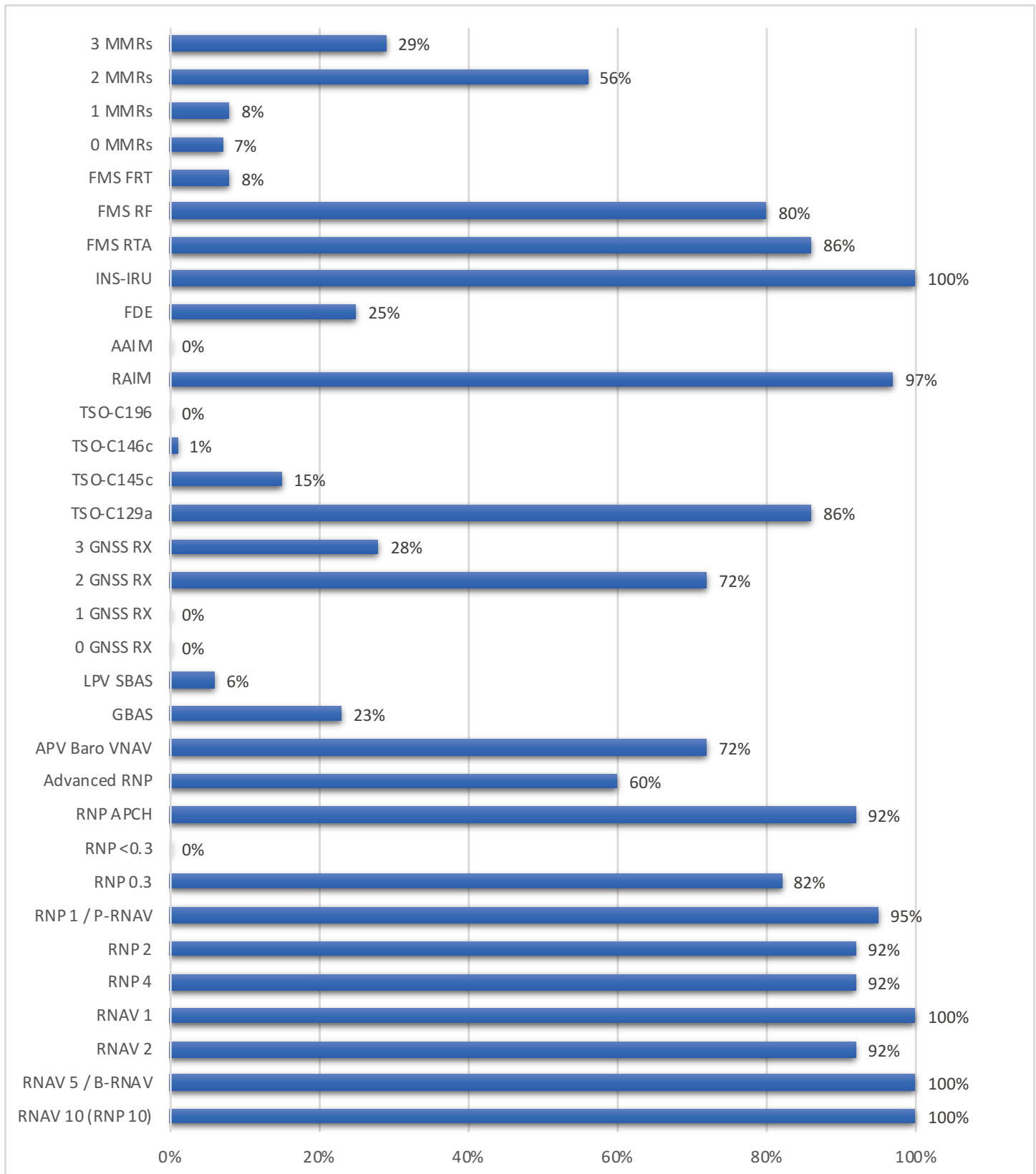
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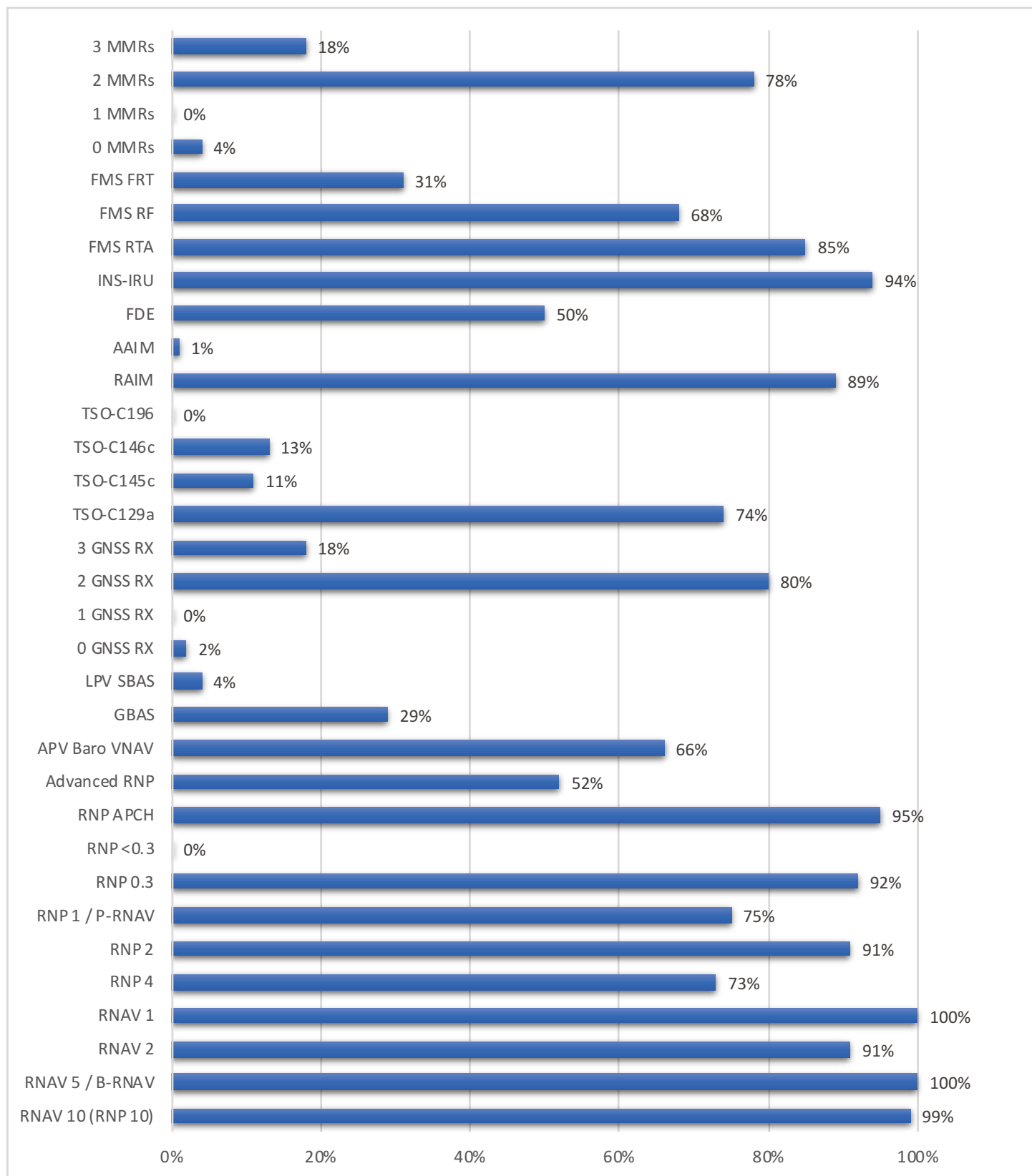


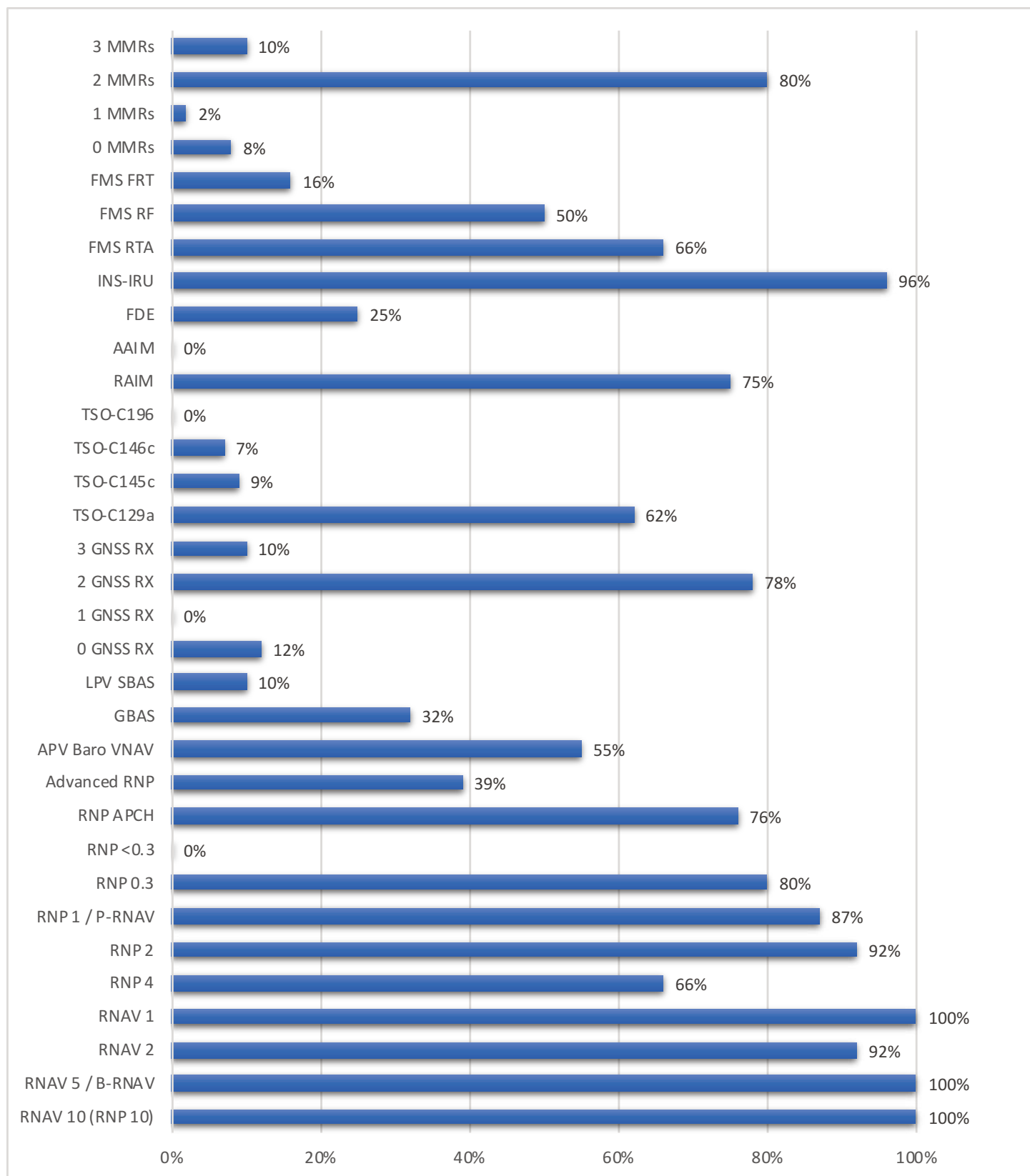
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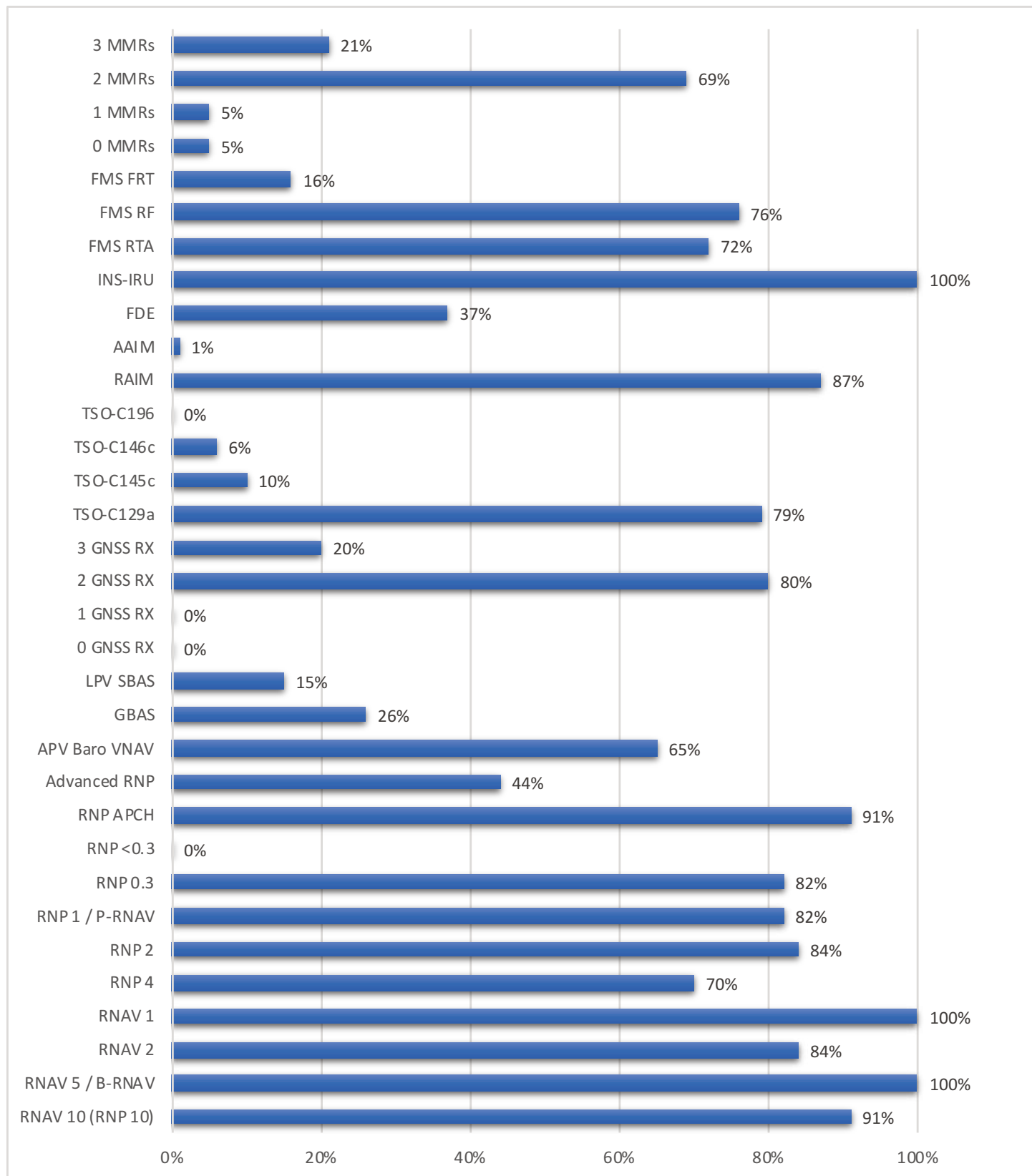


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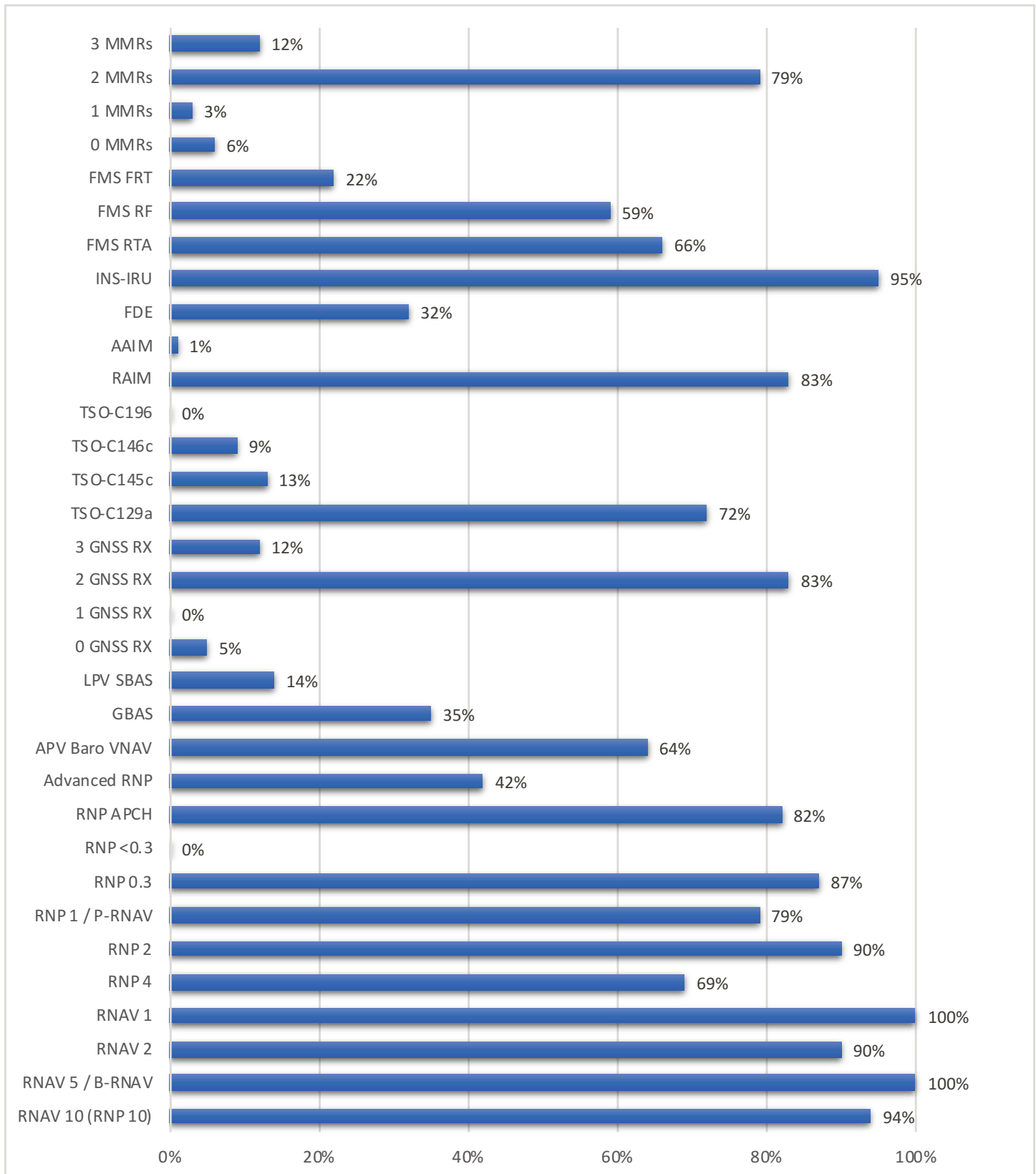


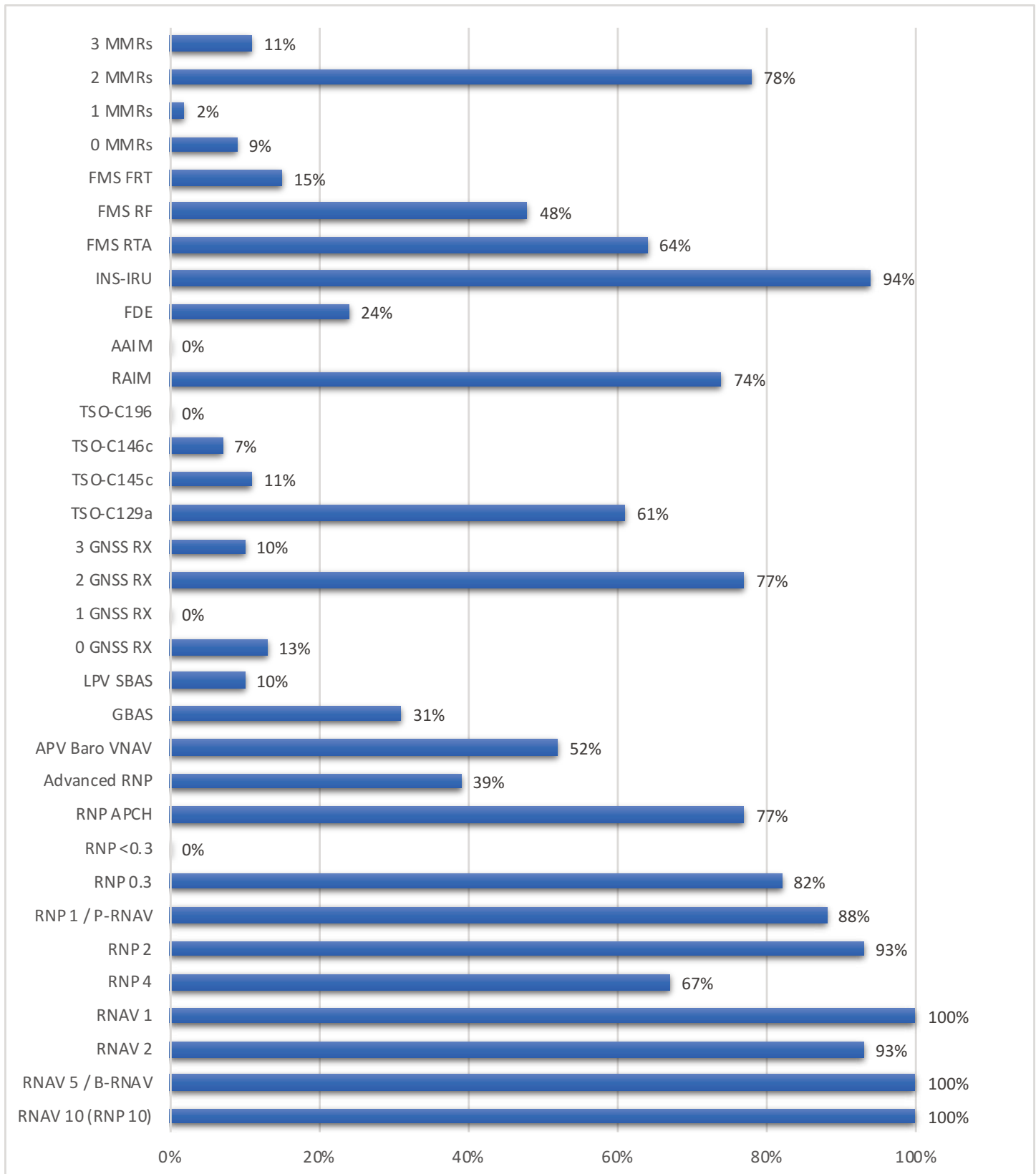


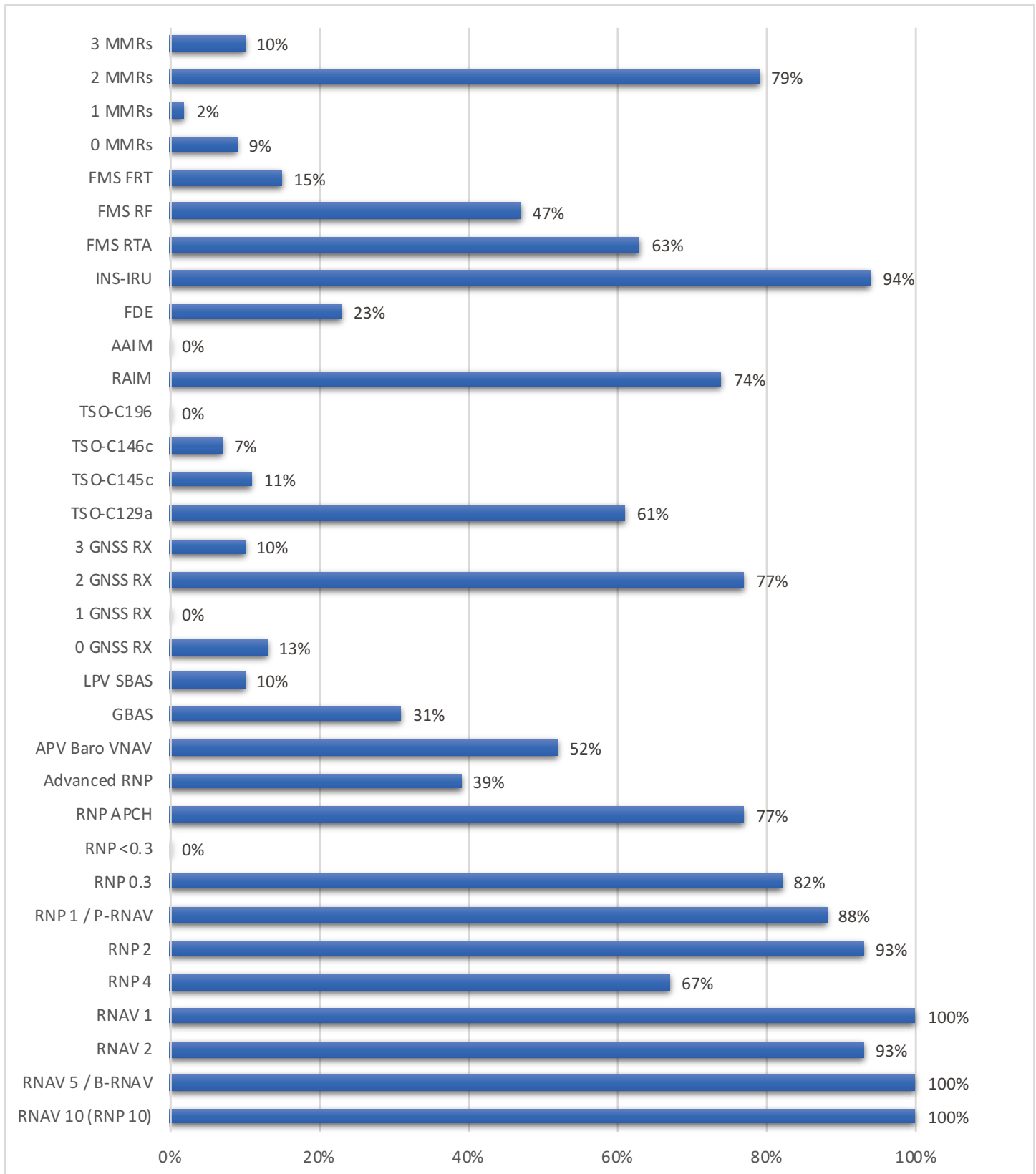




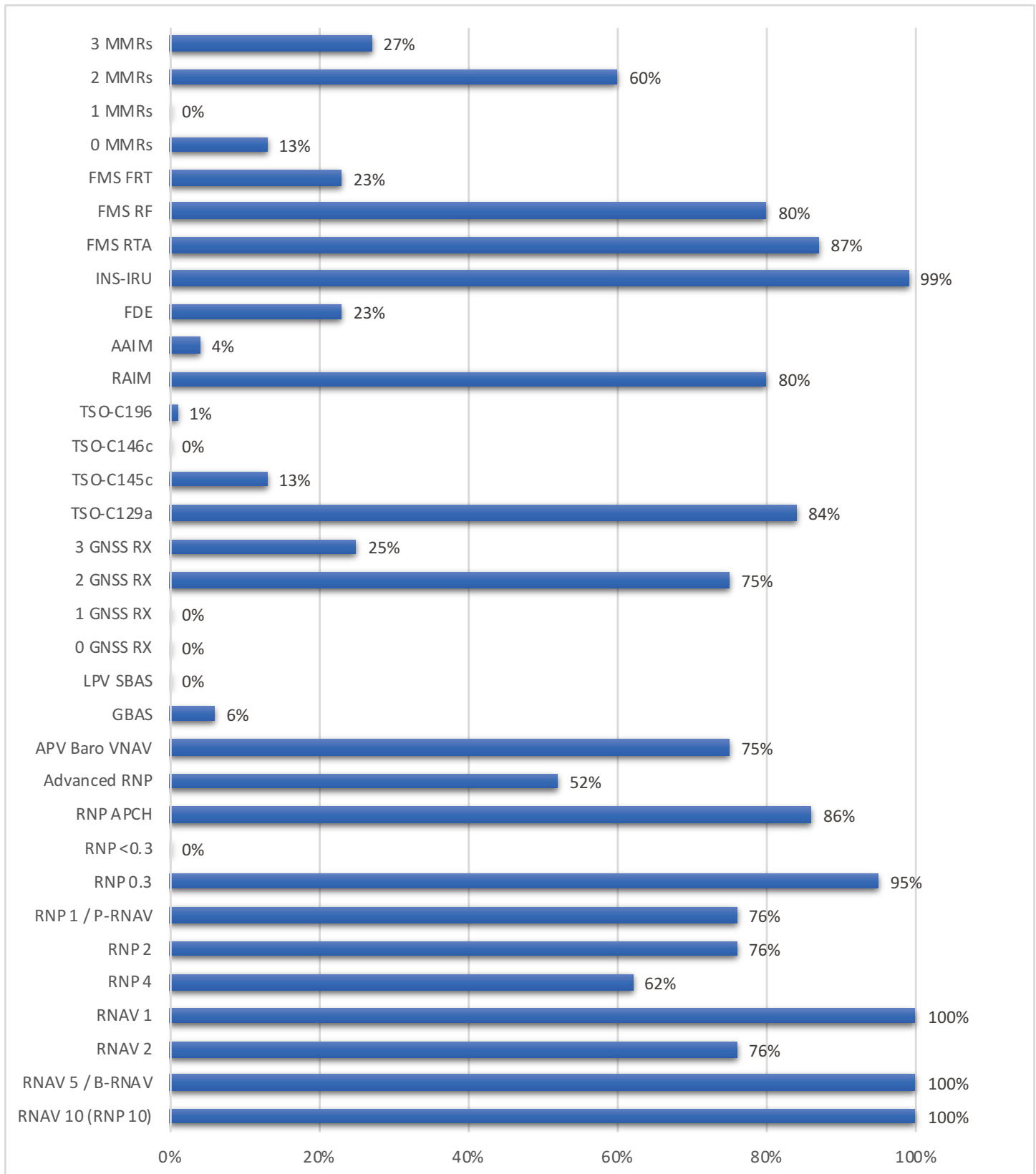
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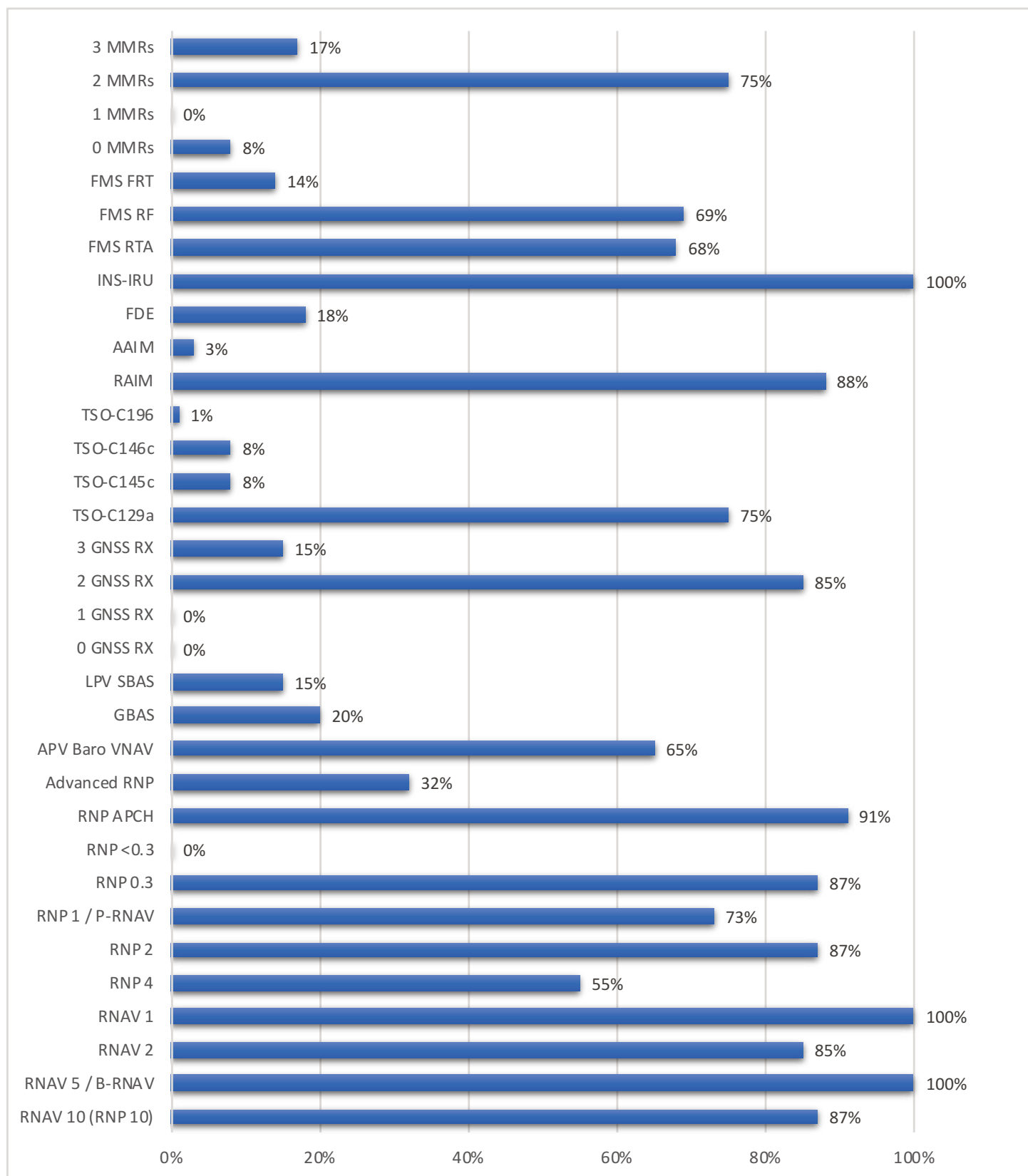


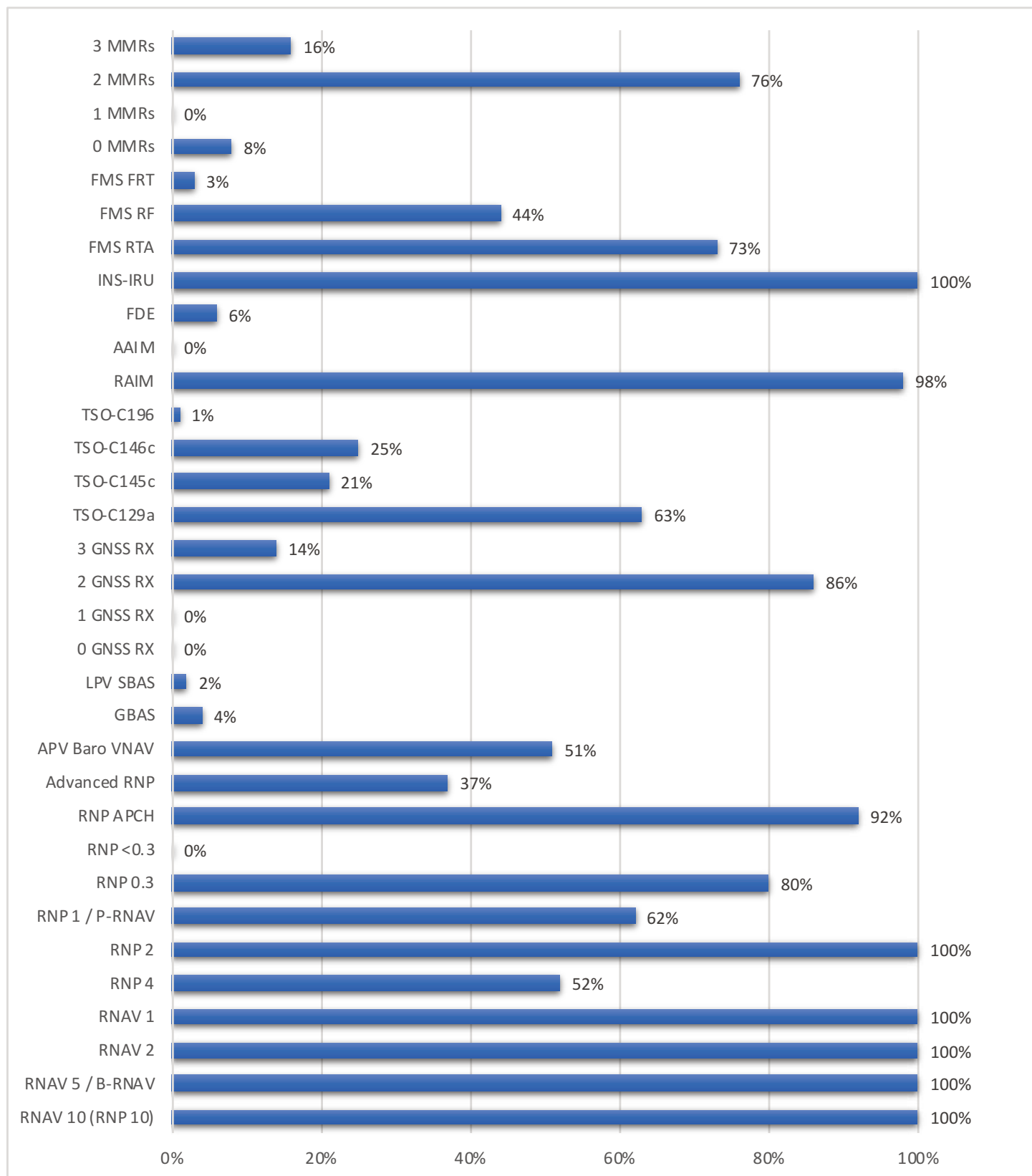


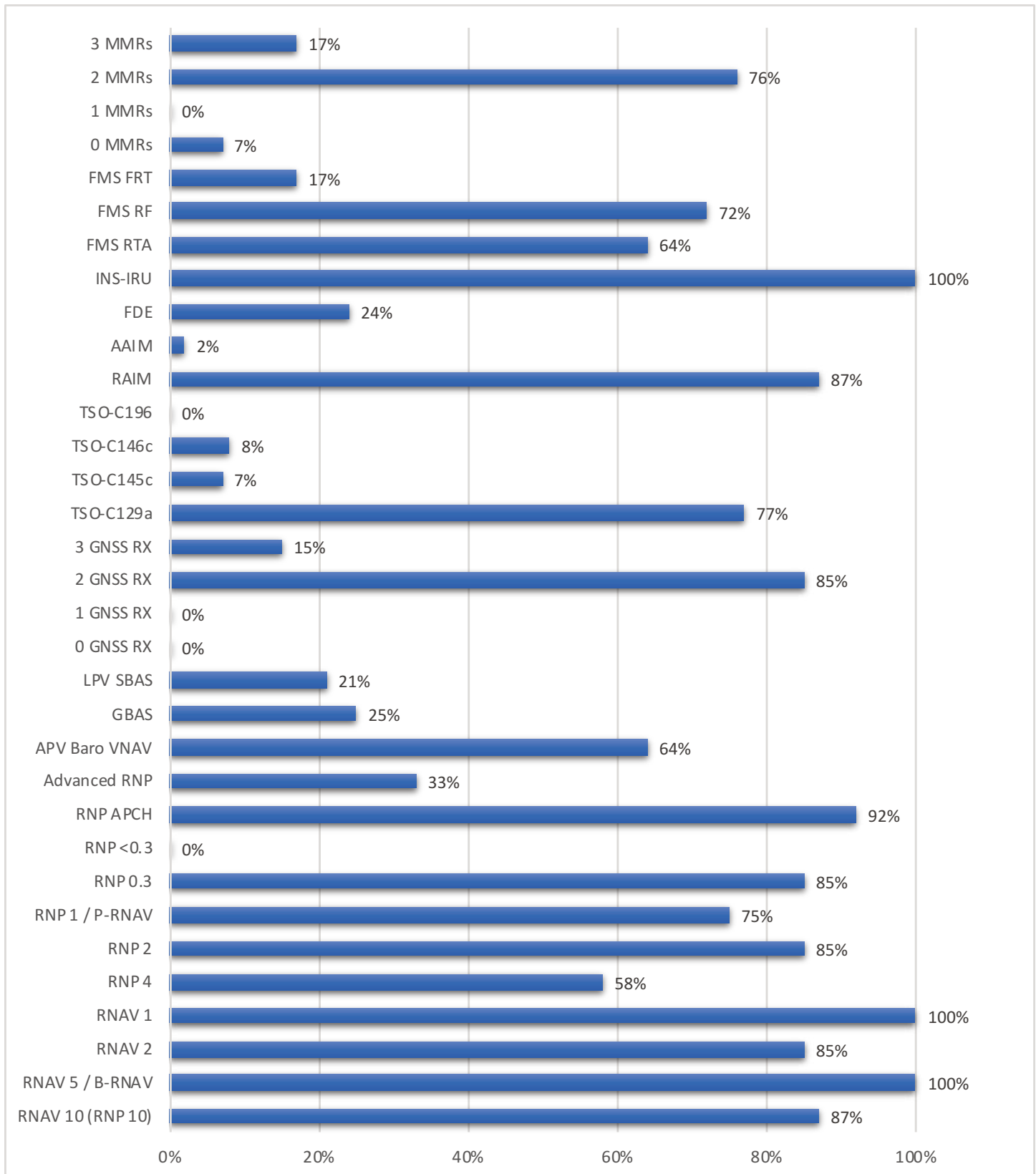


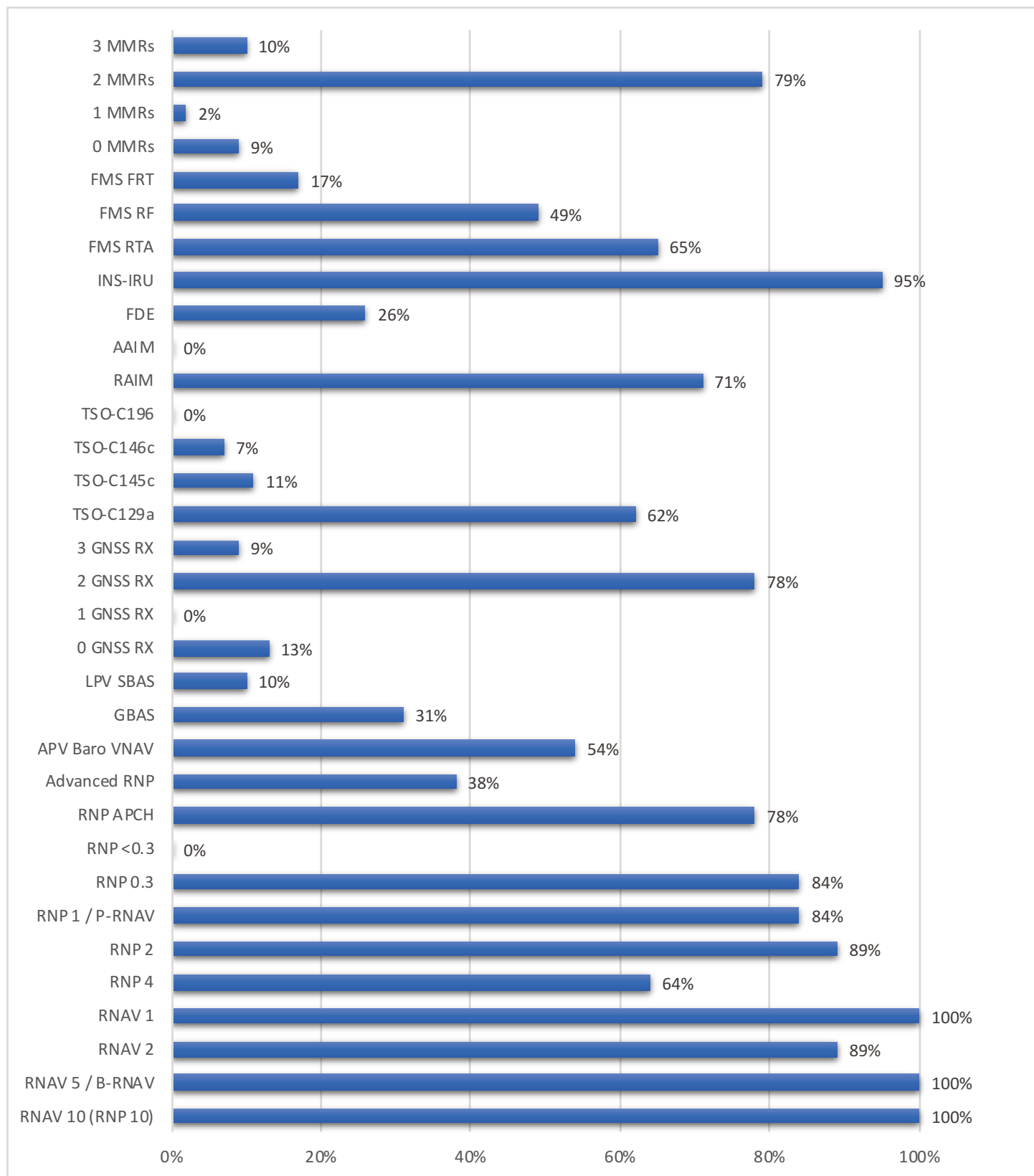
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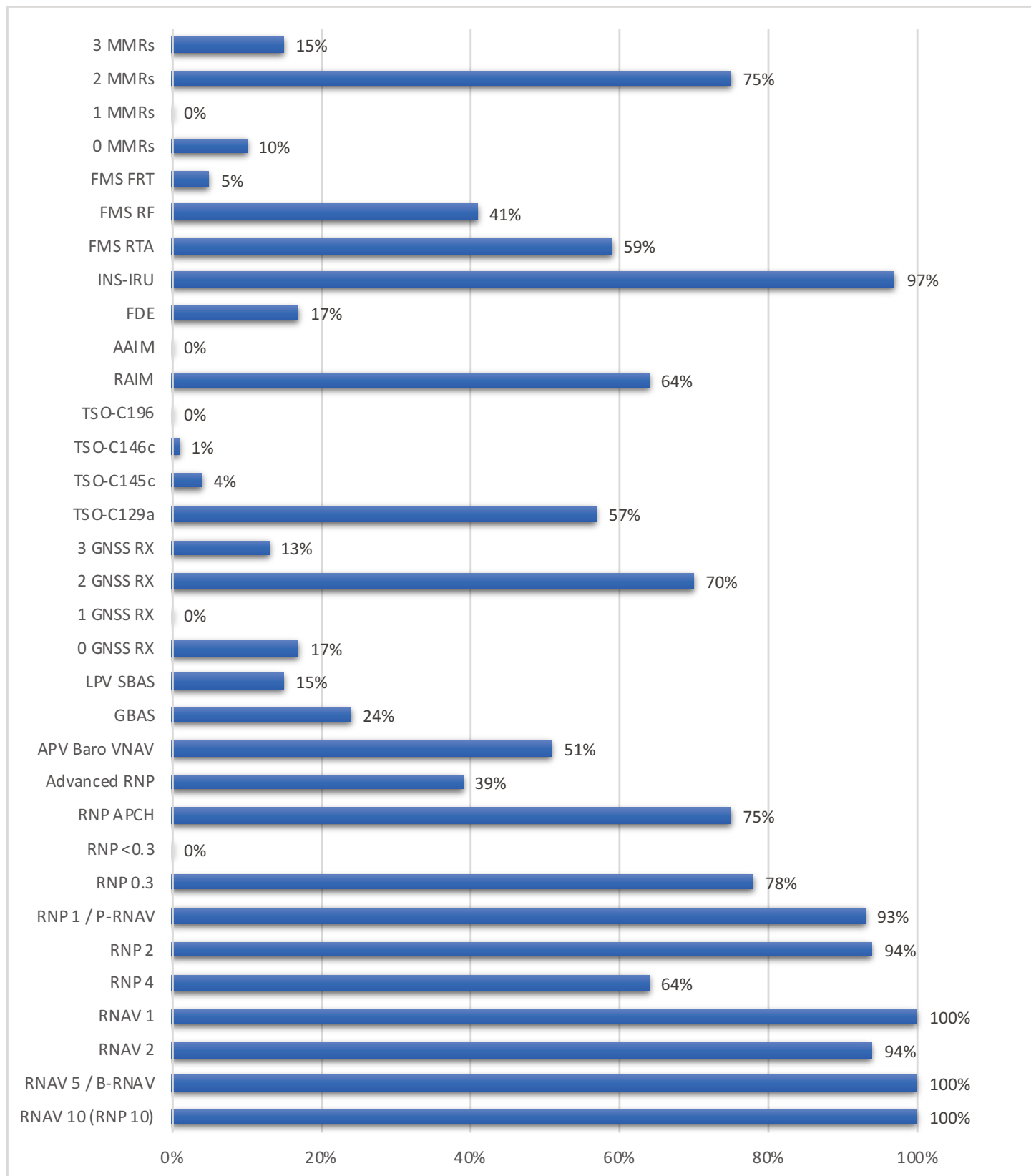


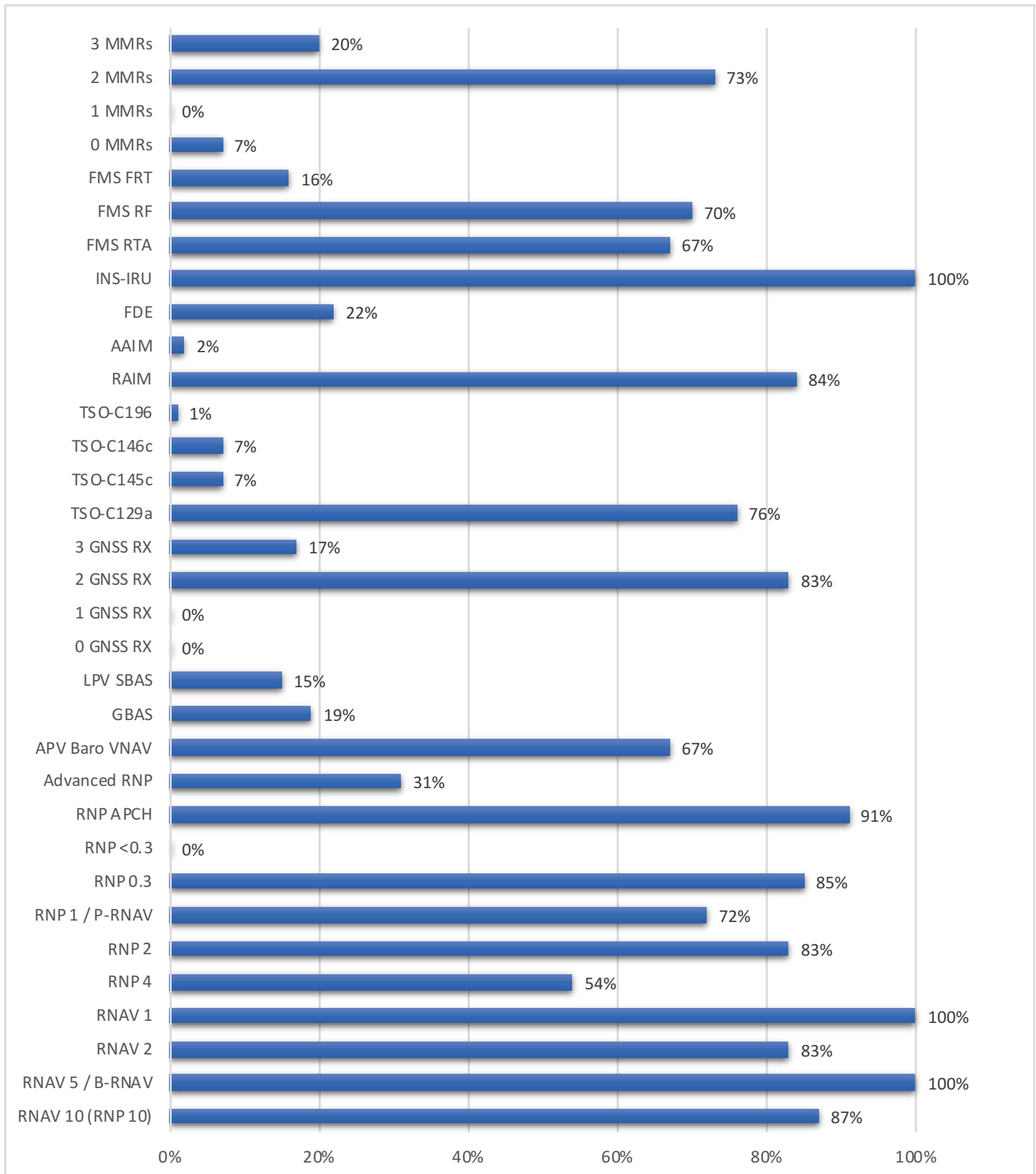




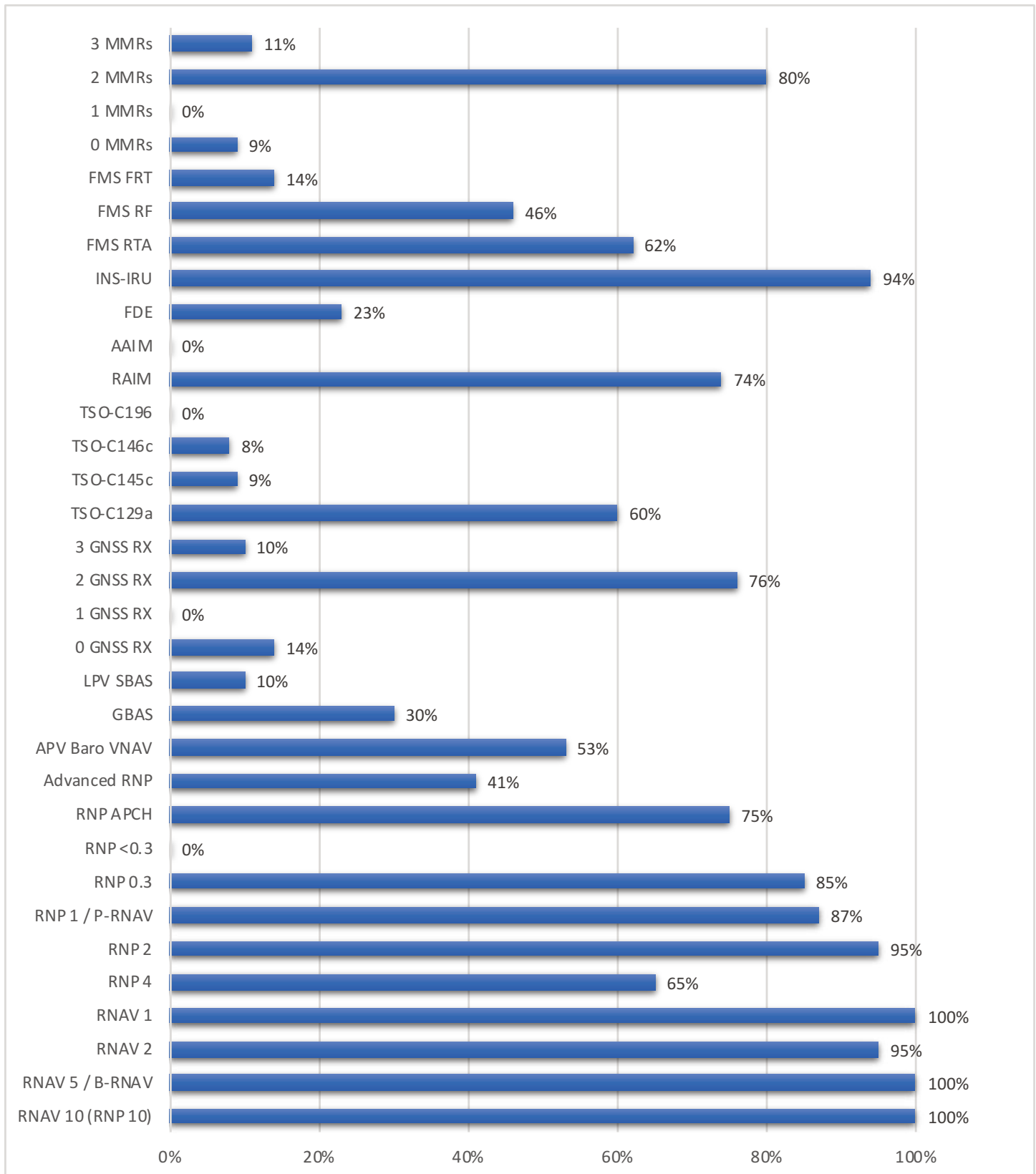




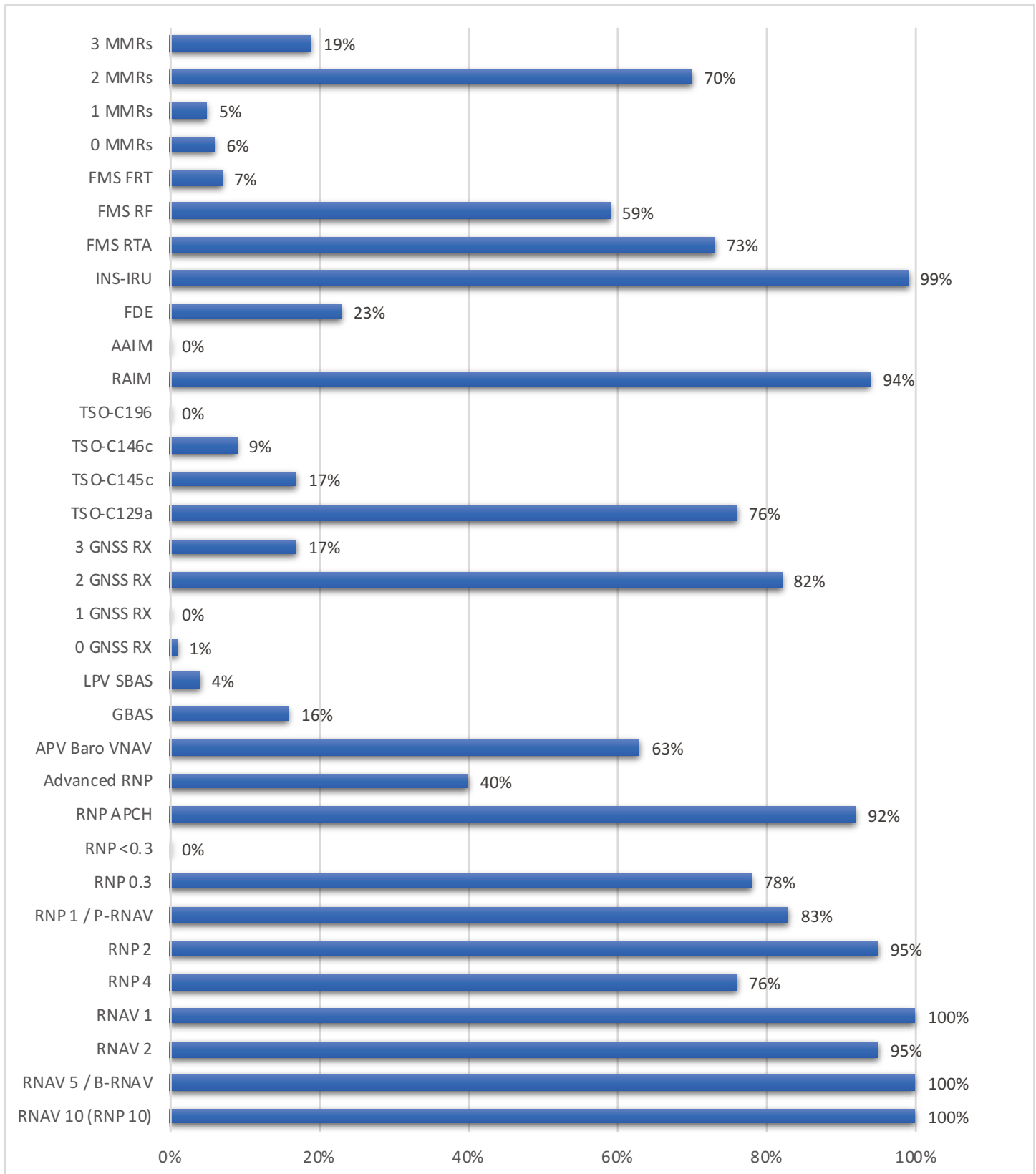




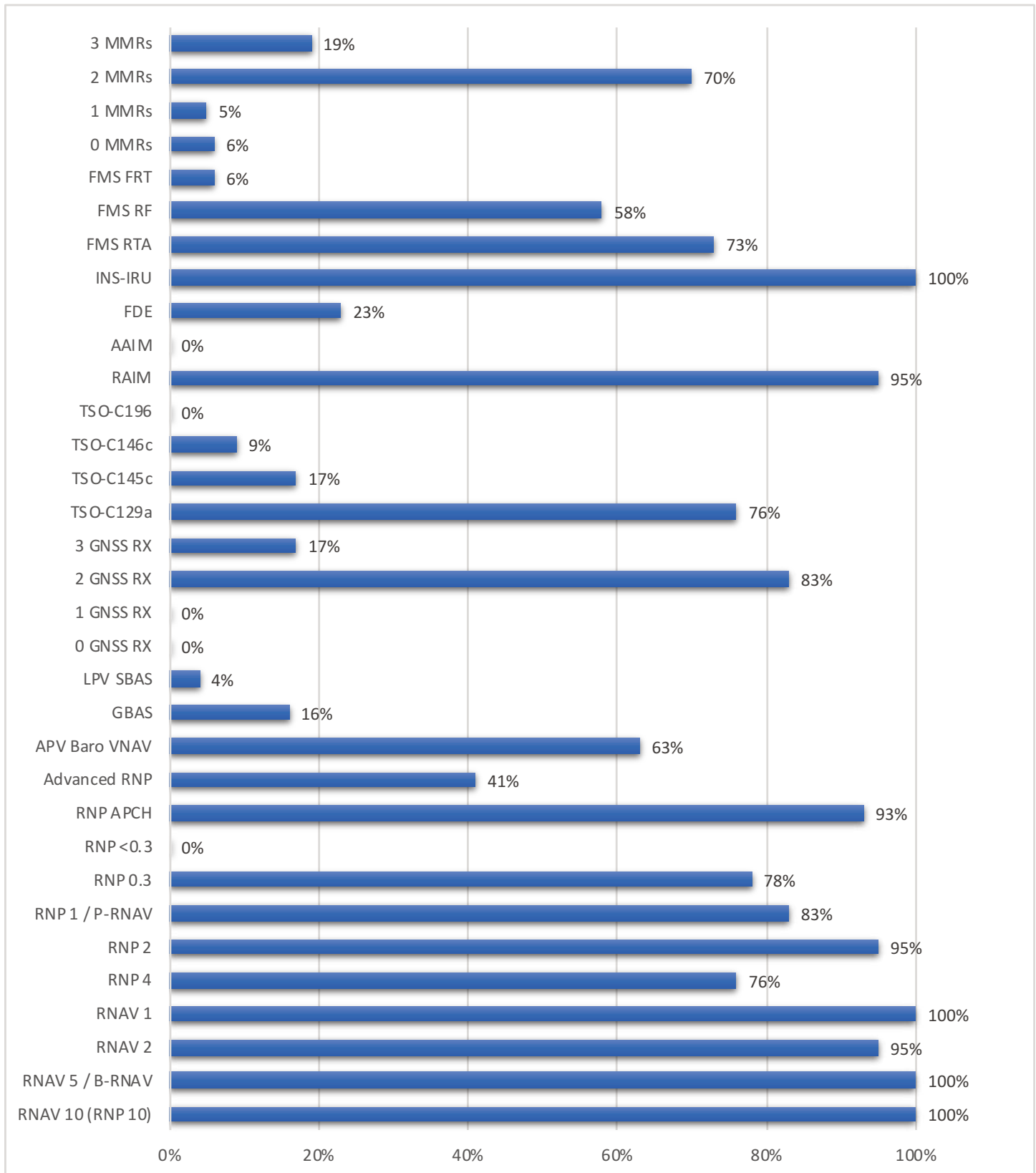
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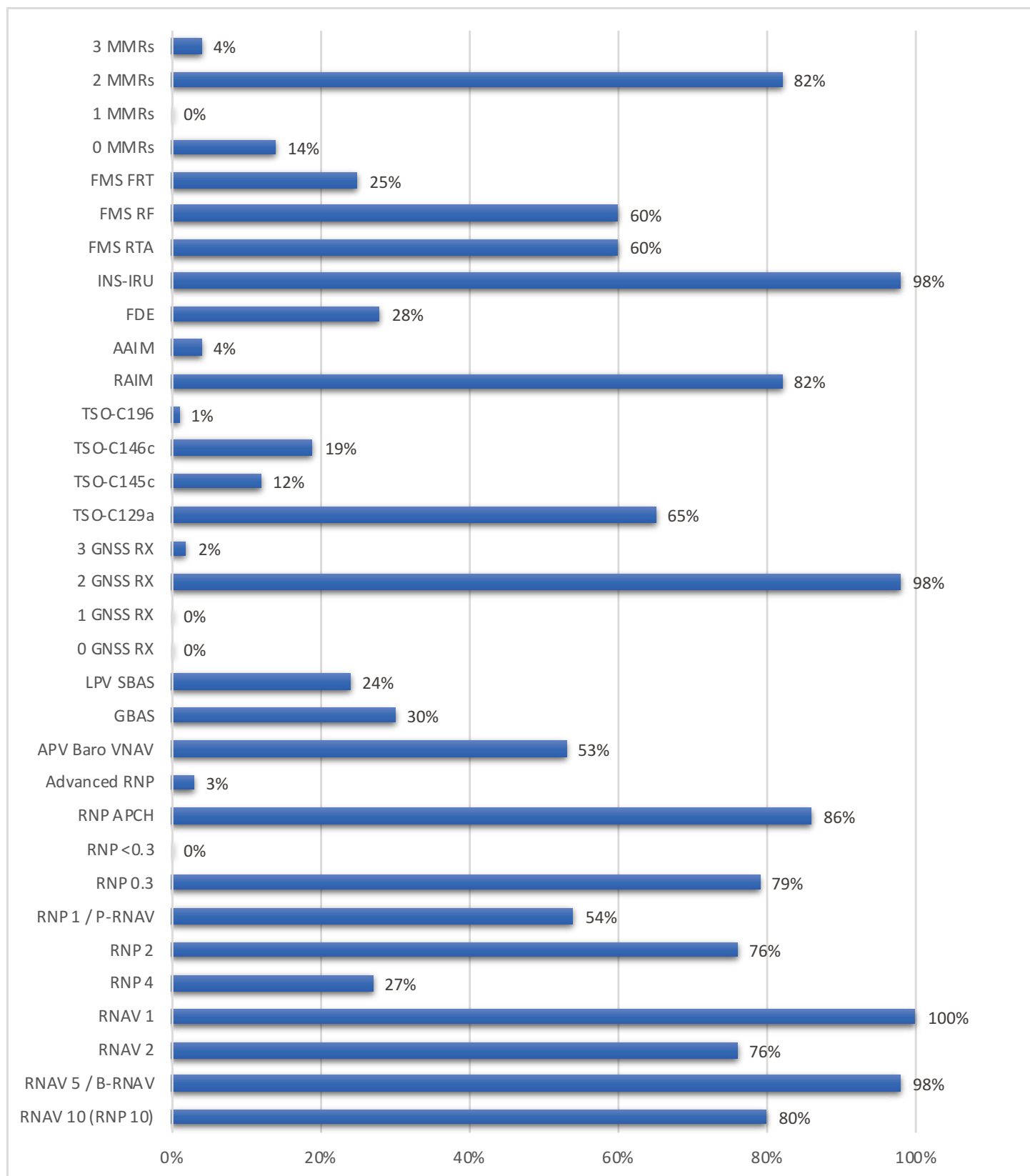


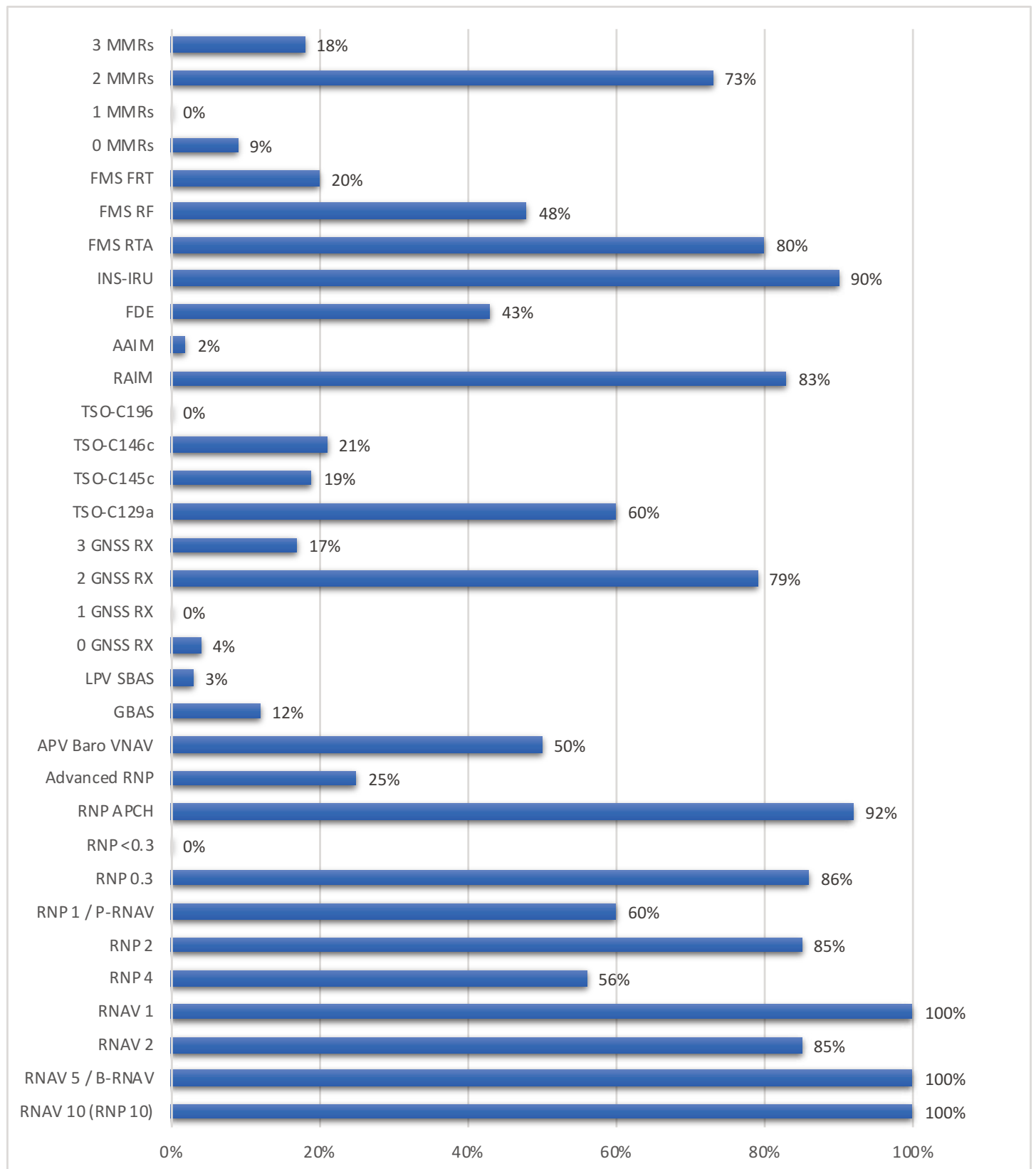
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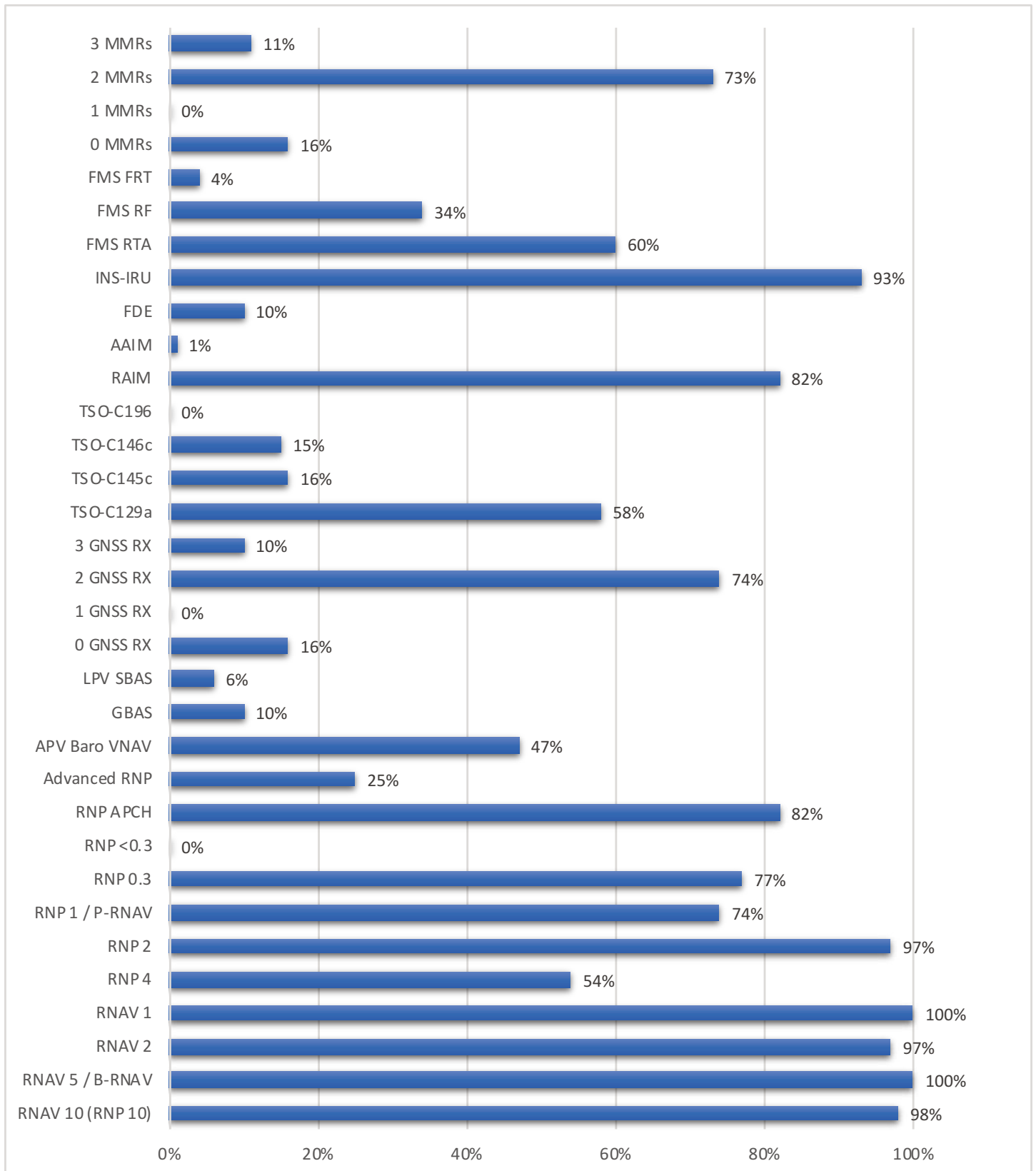


Gander Oceanic

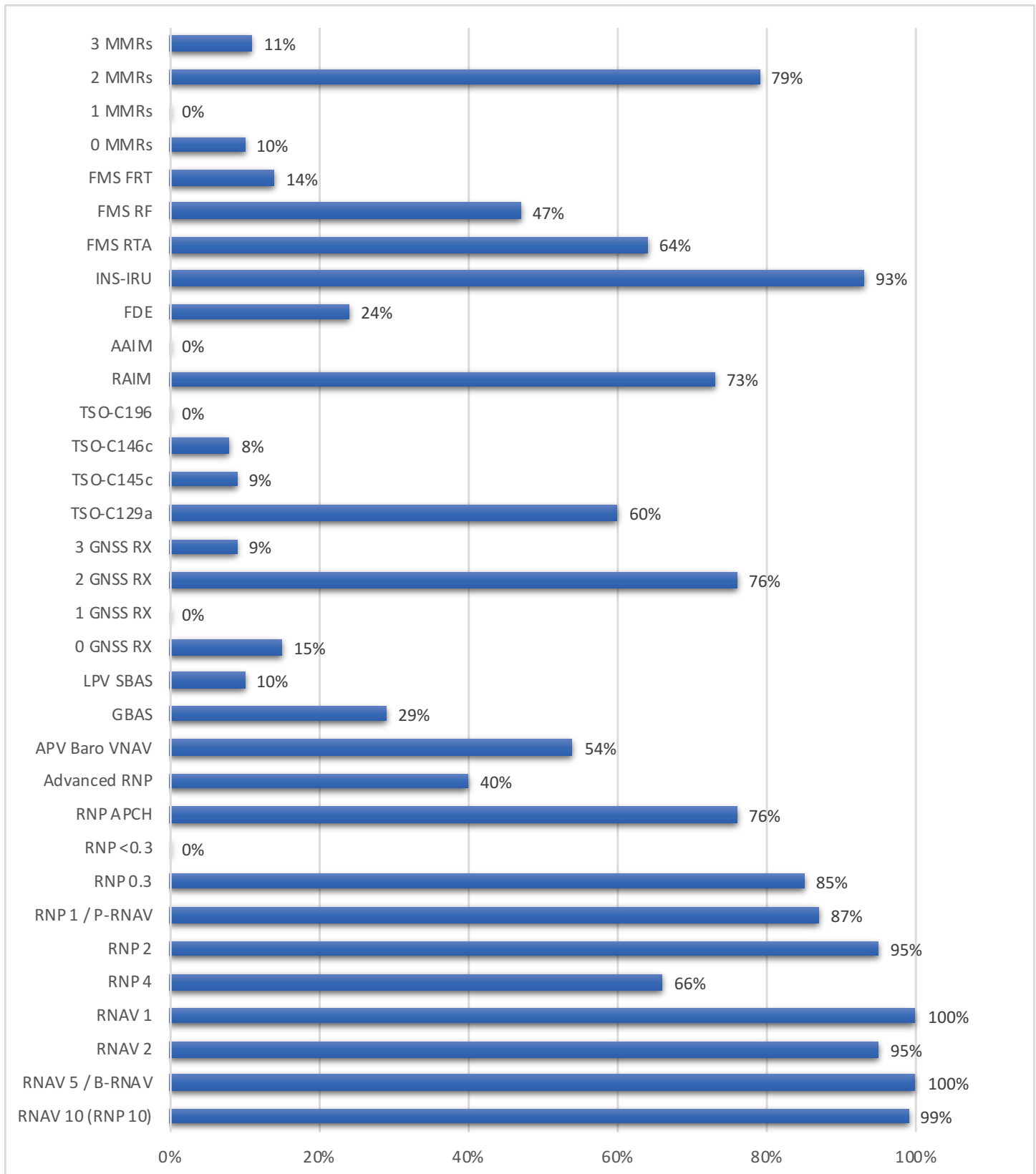




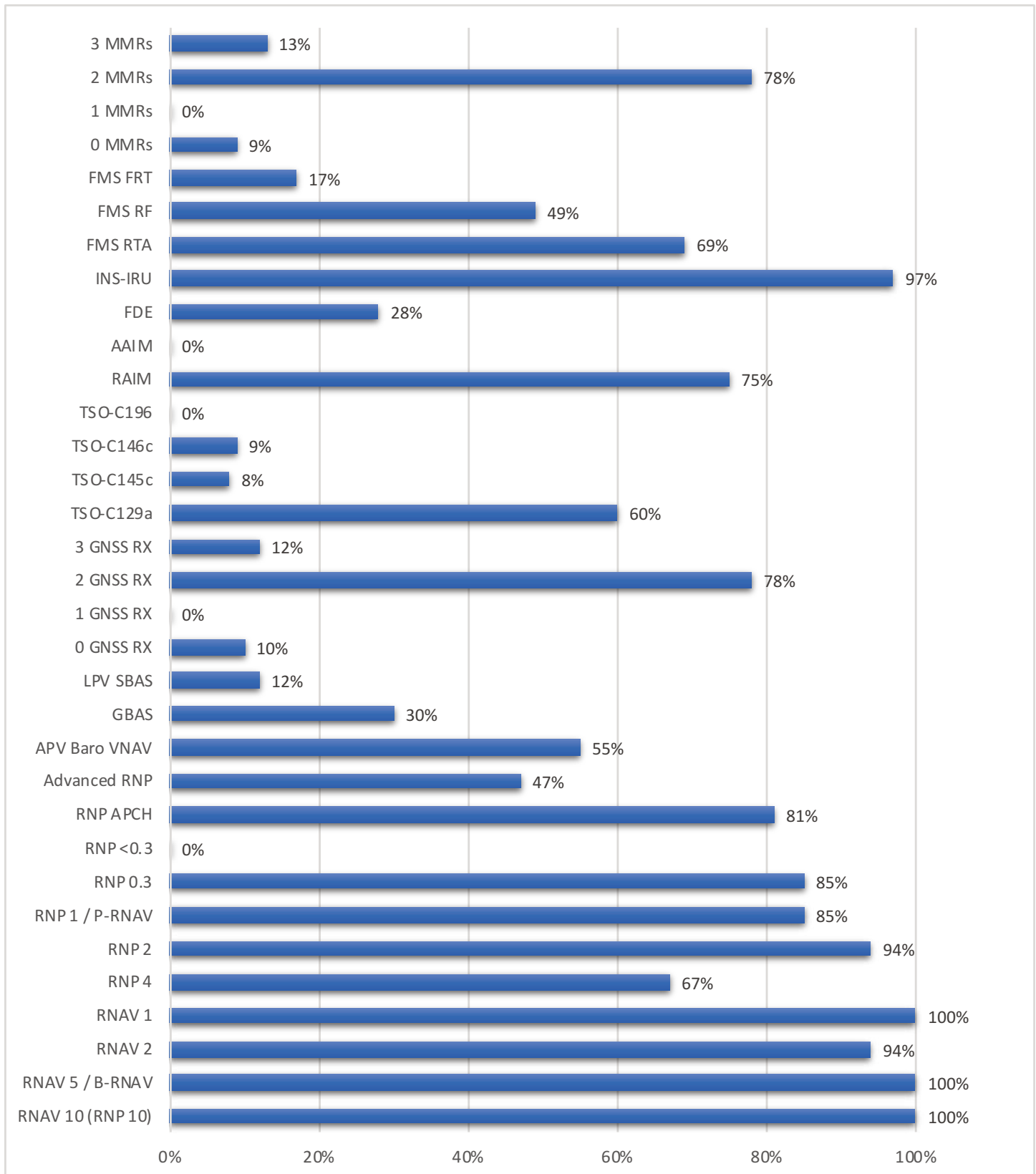


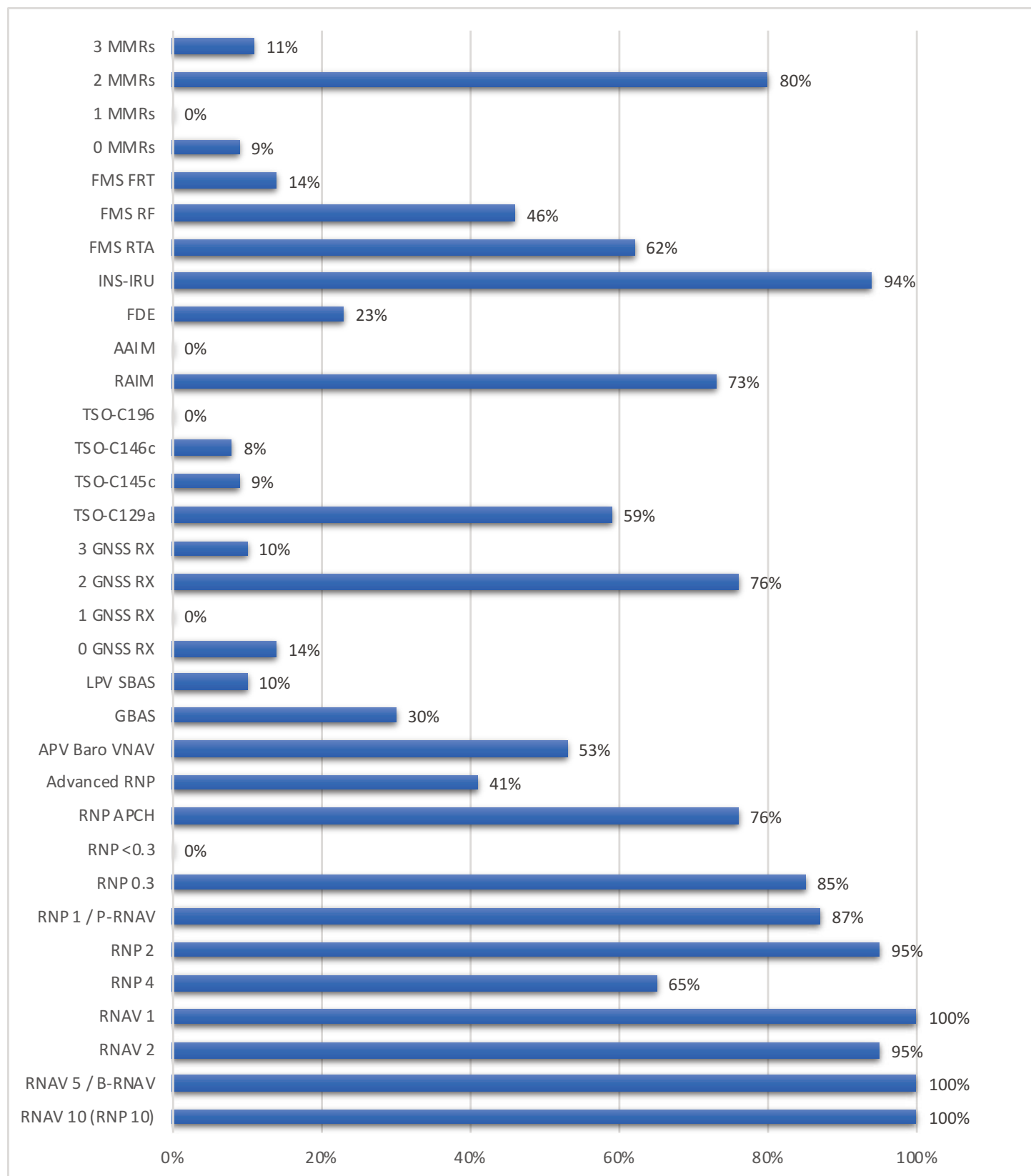


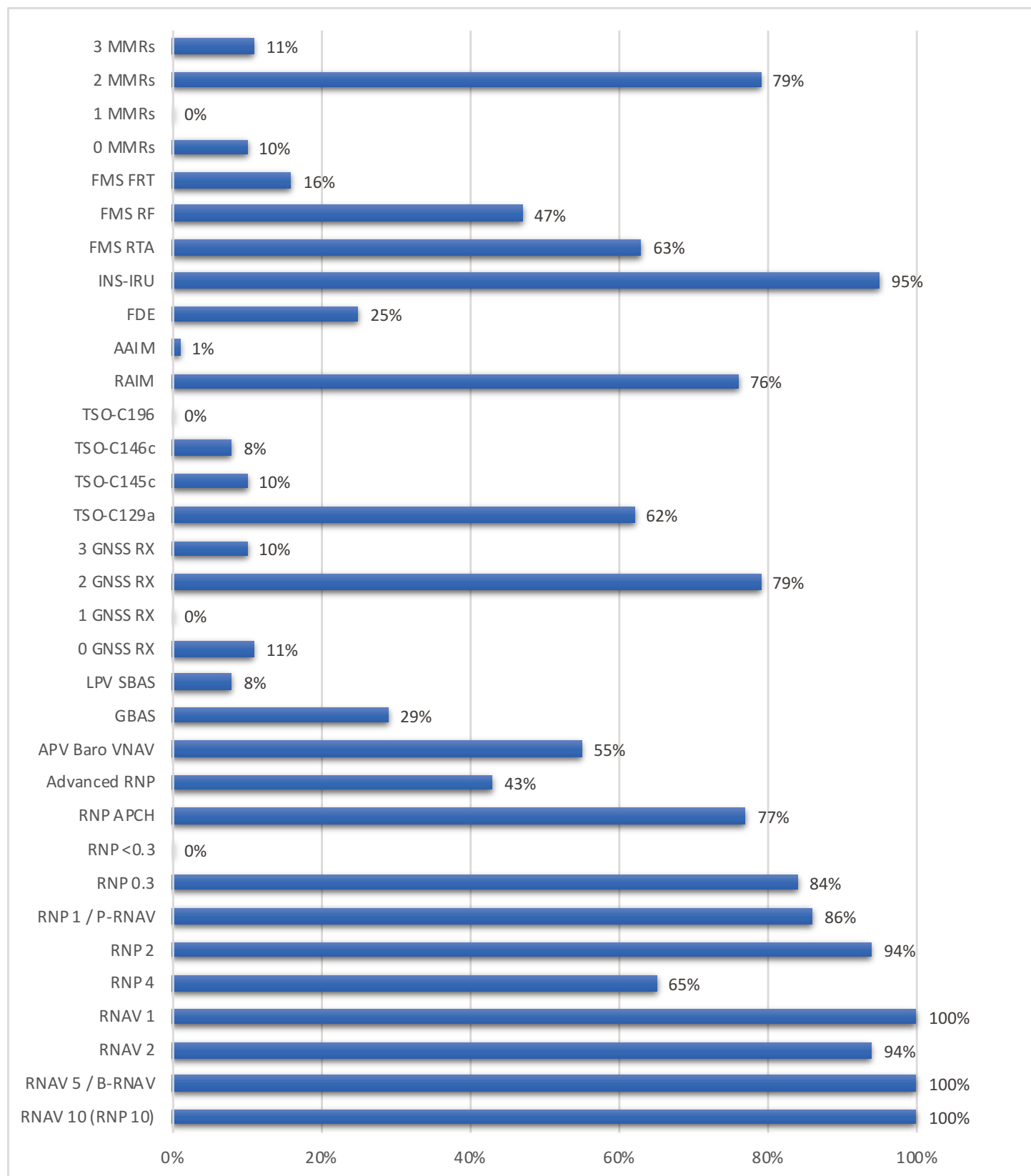
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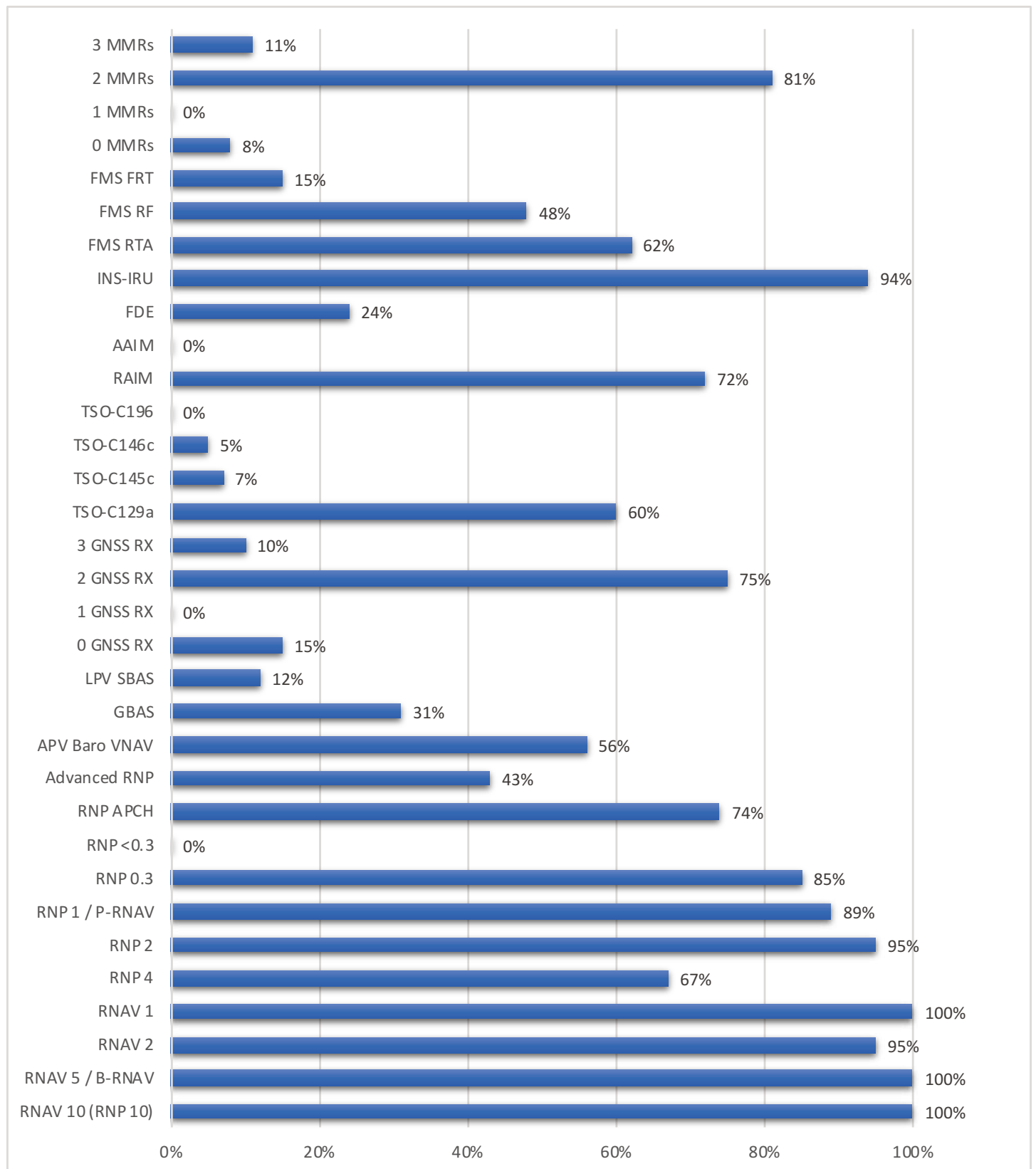


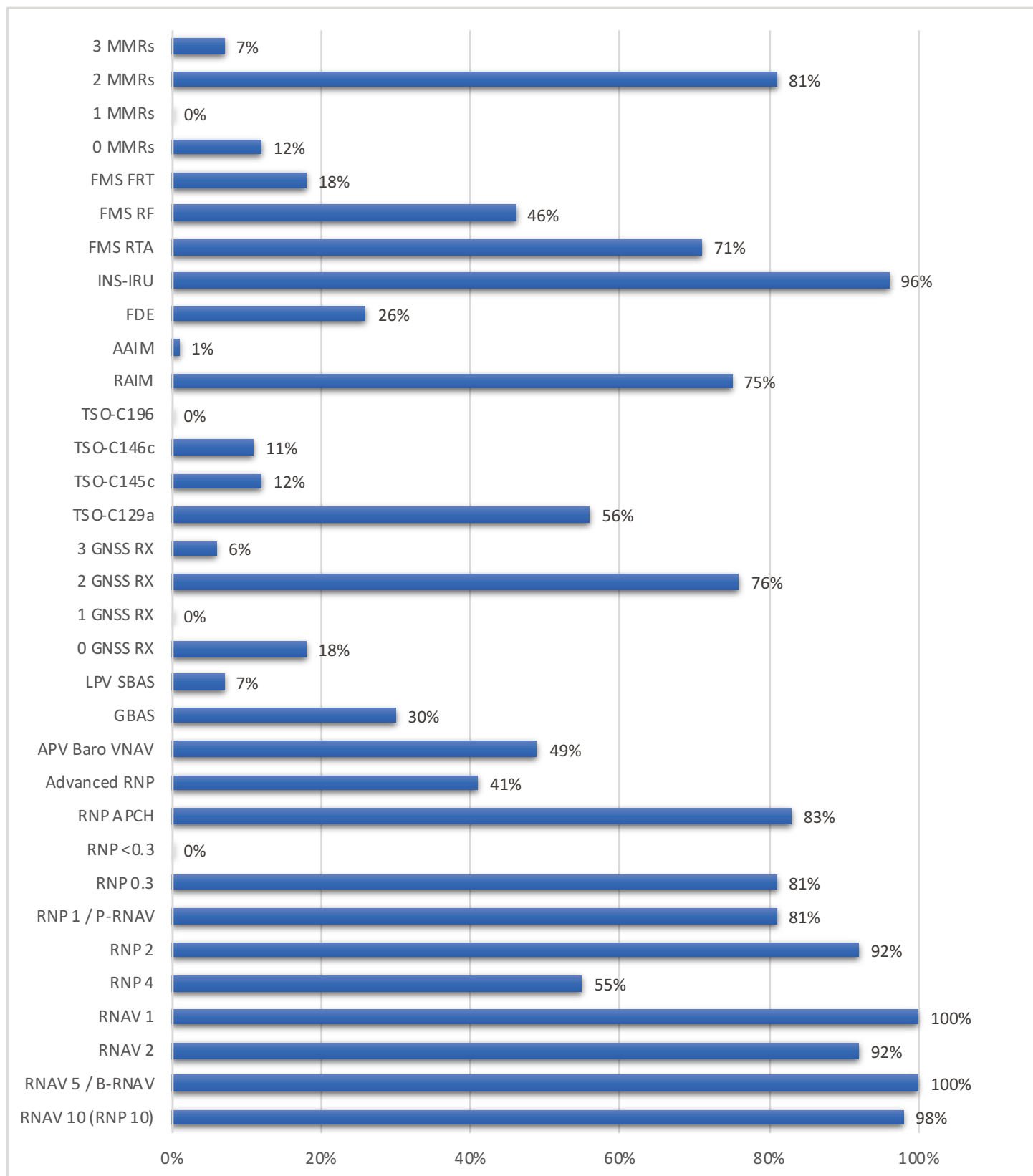
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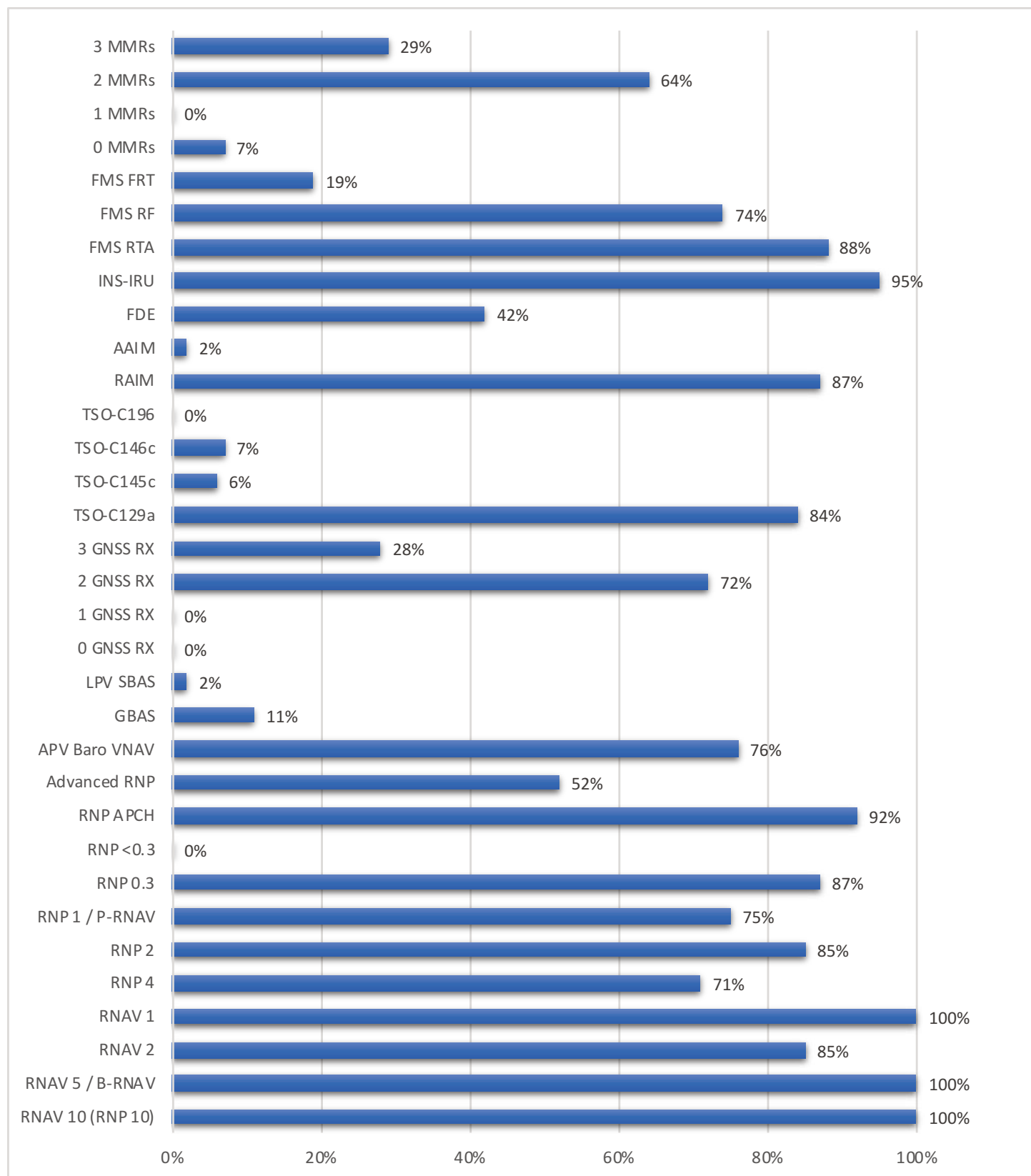


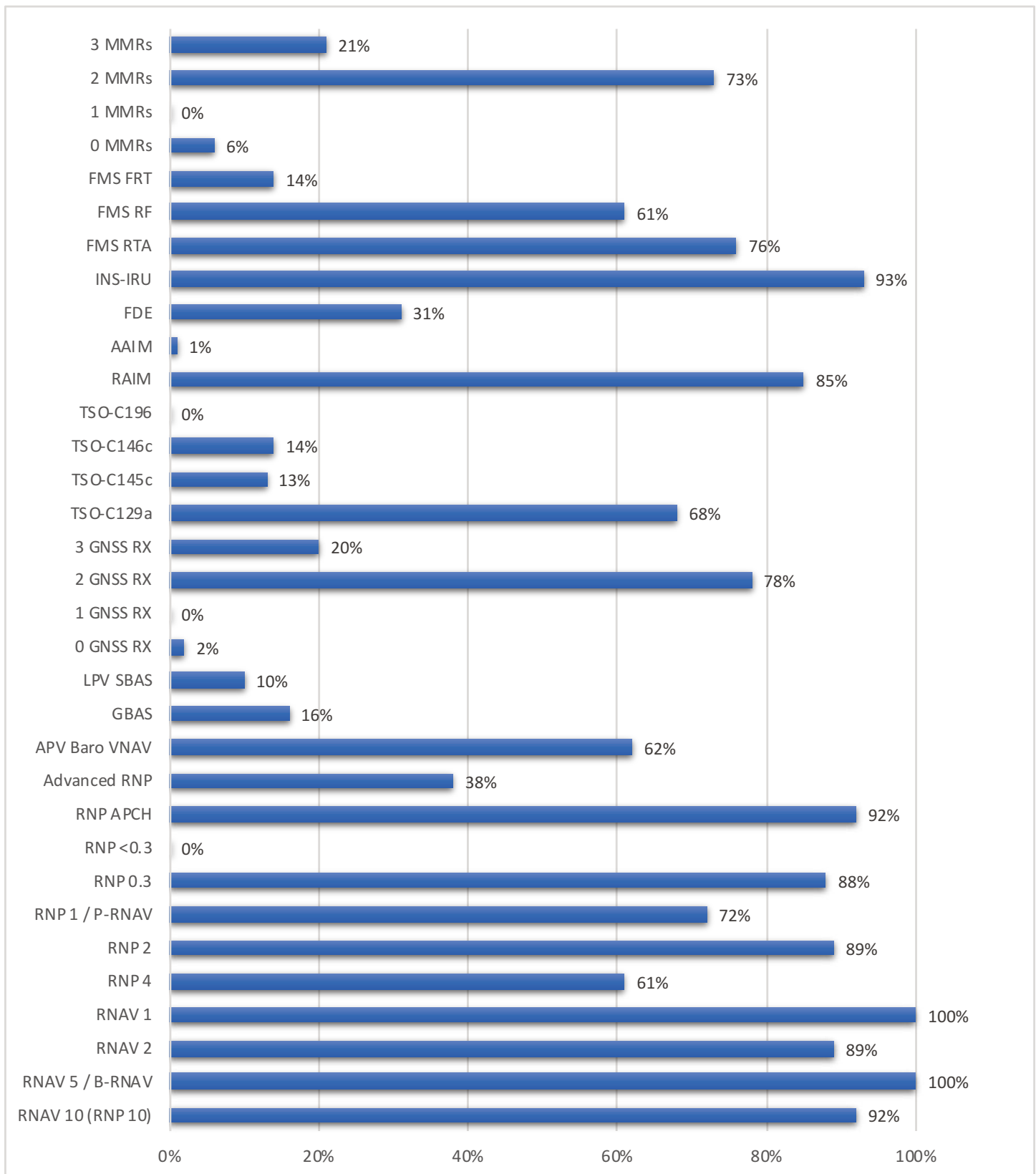




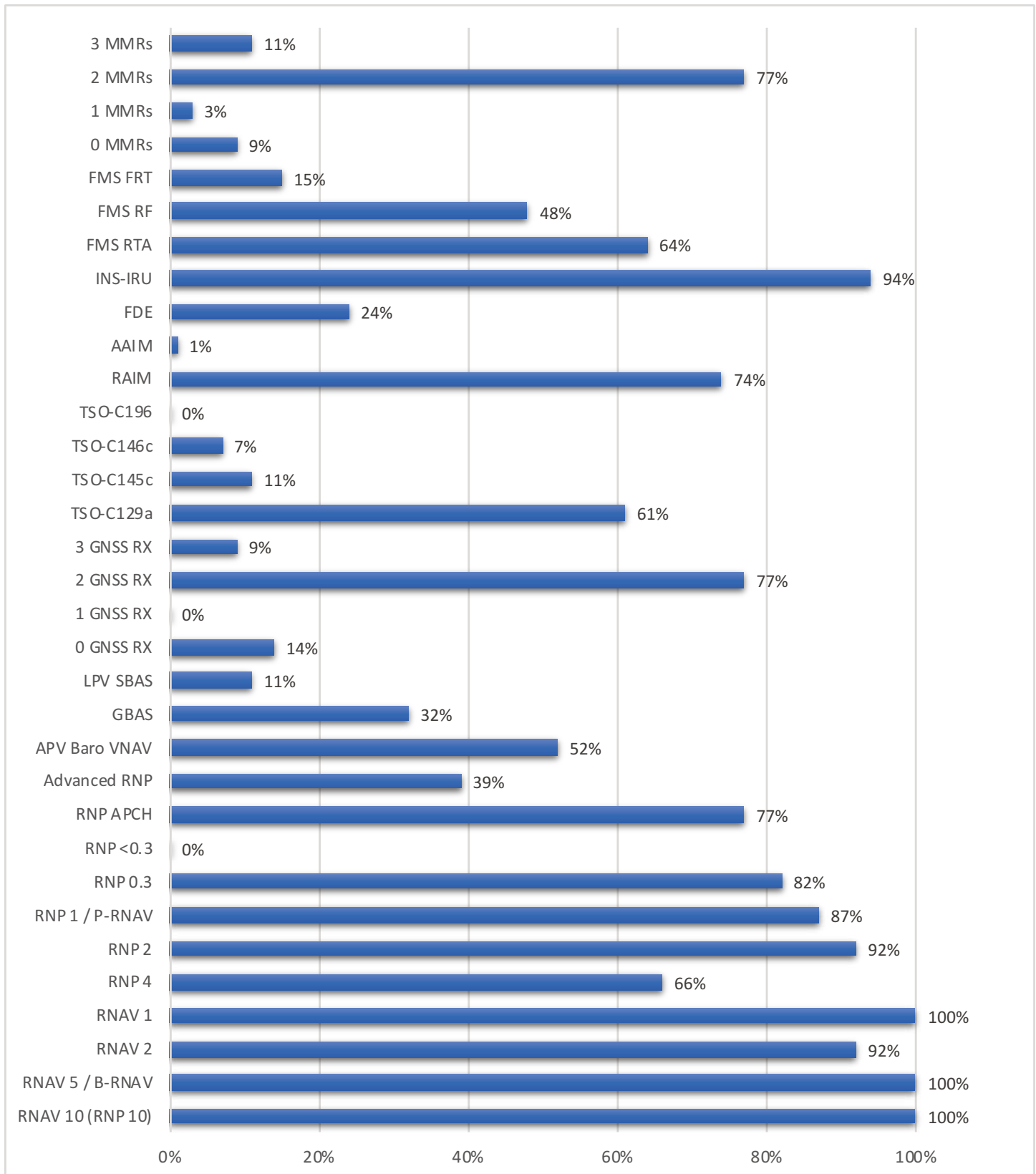


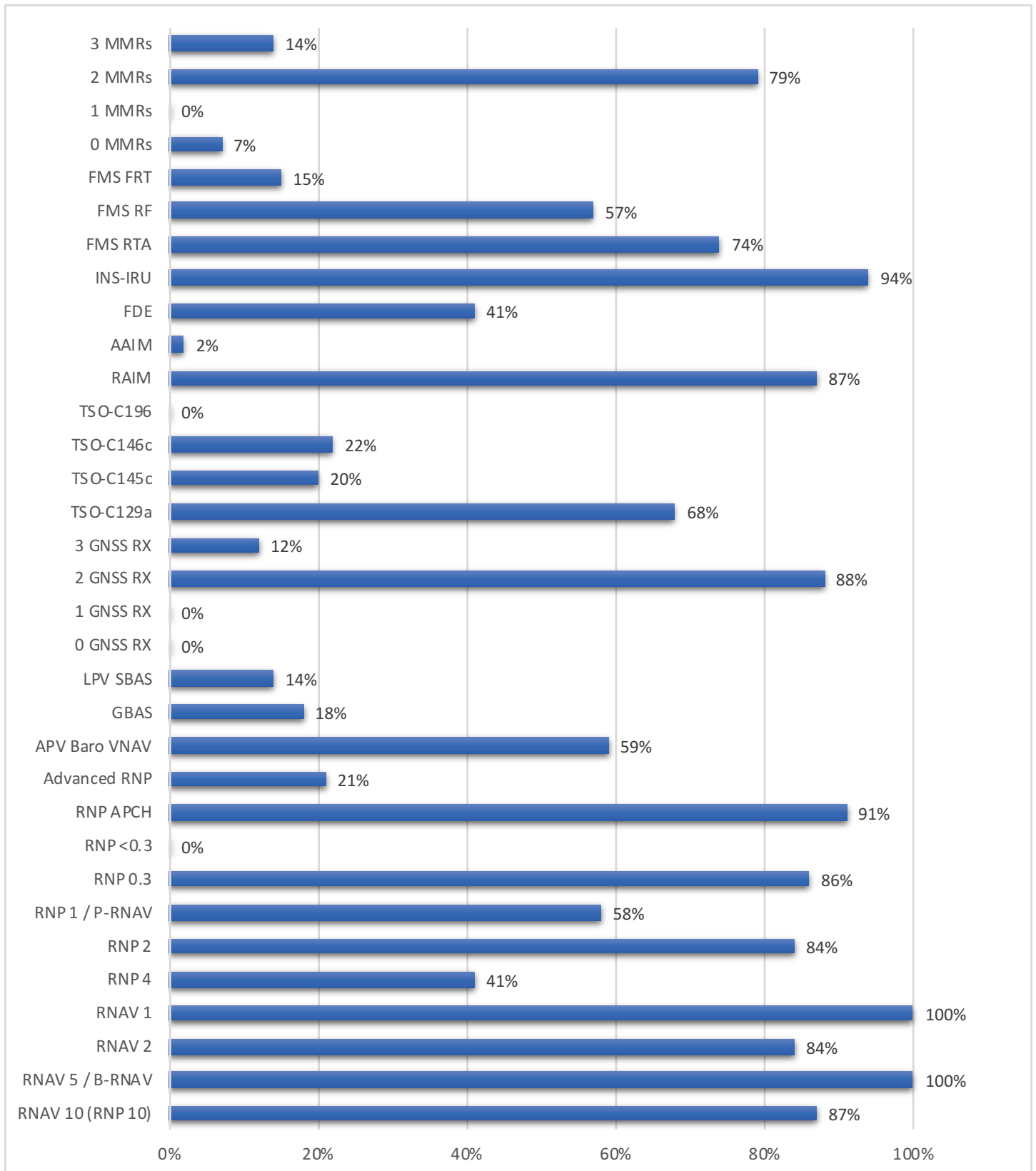




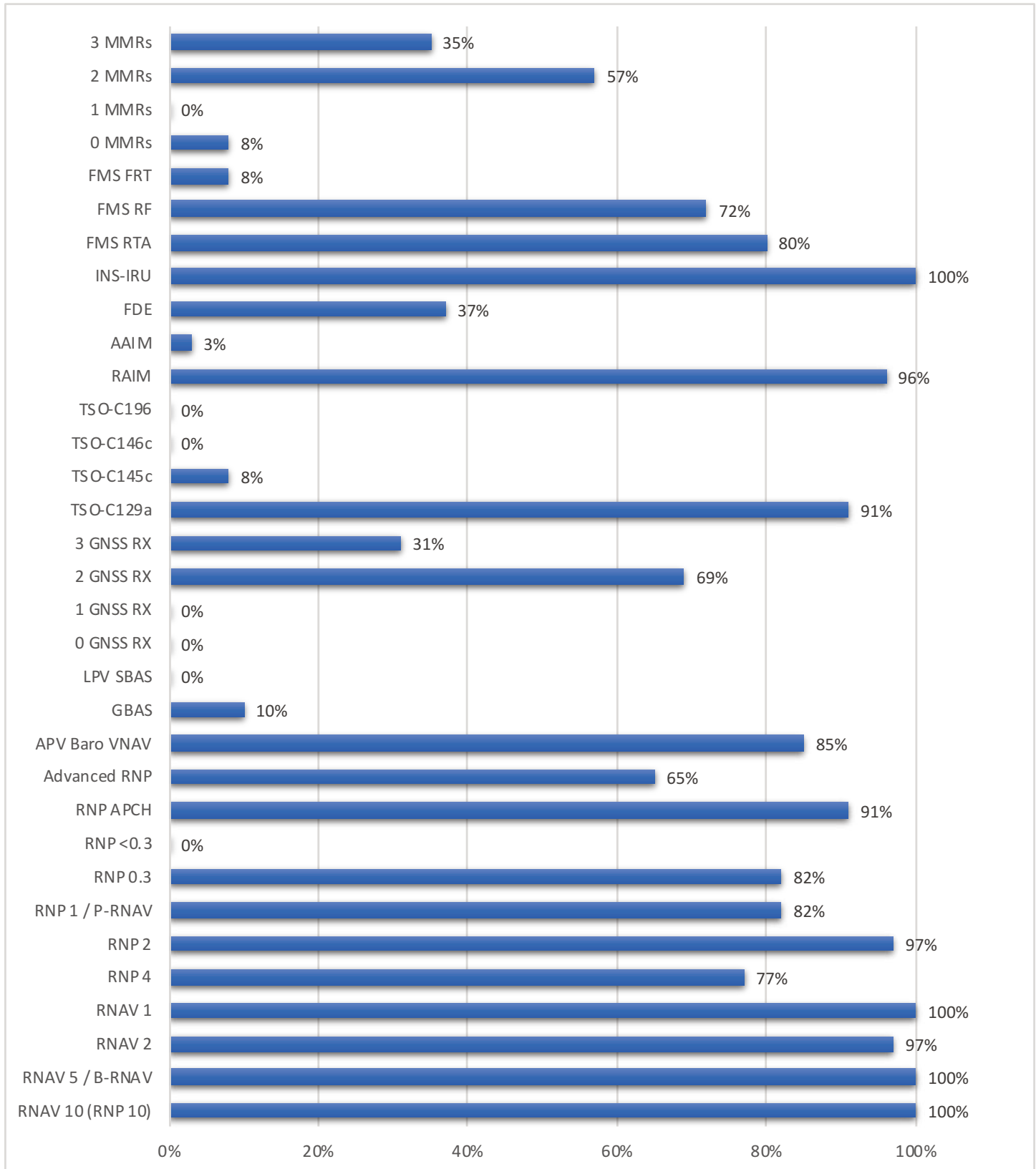


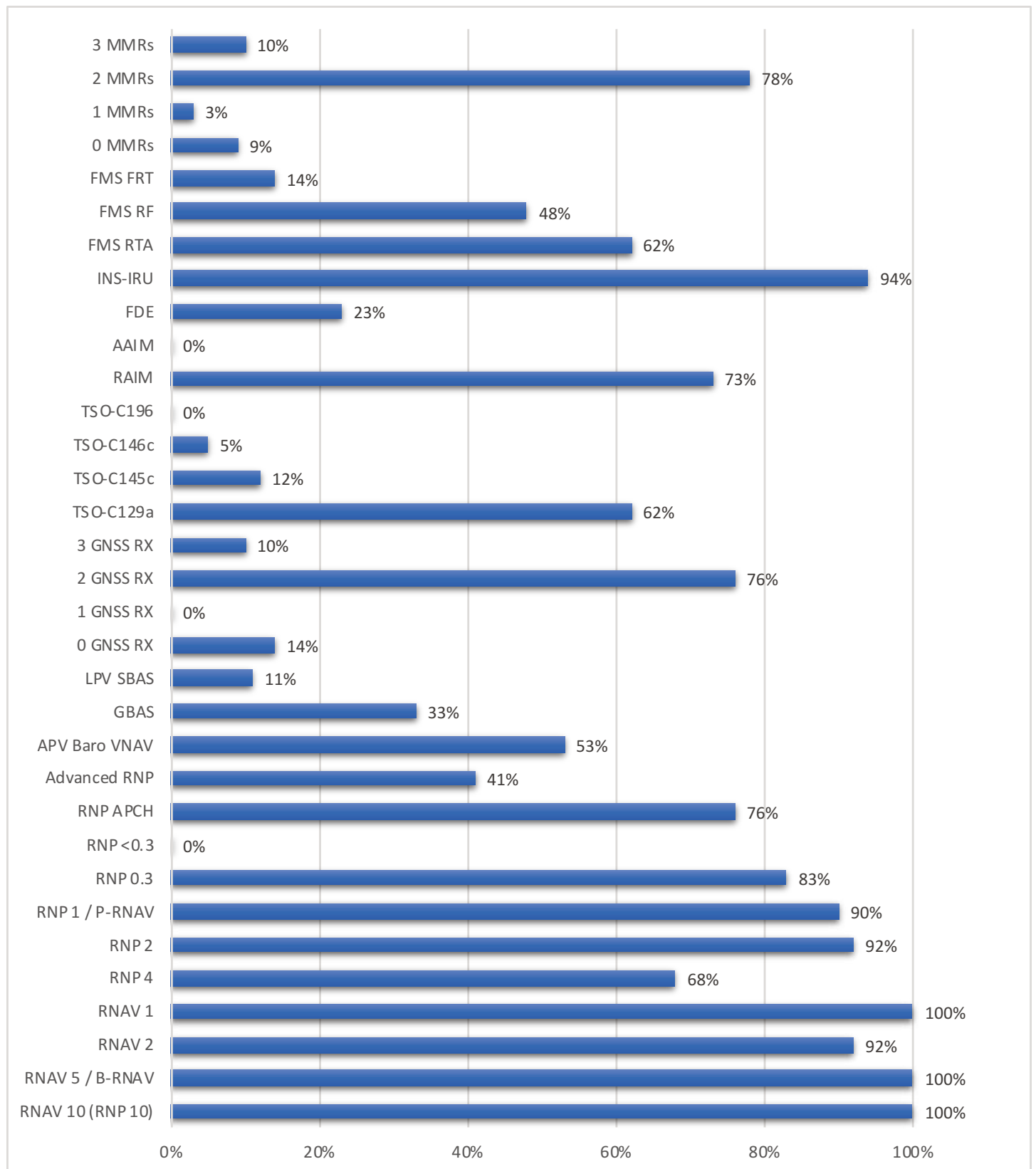
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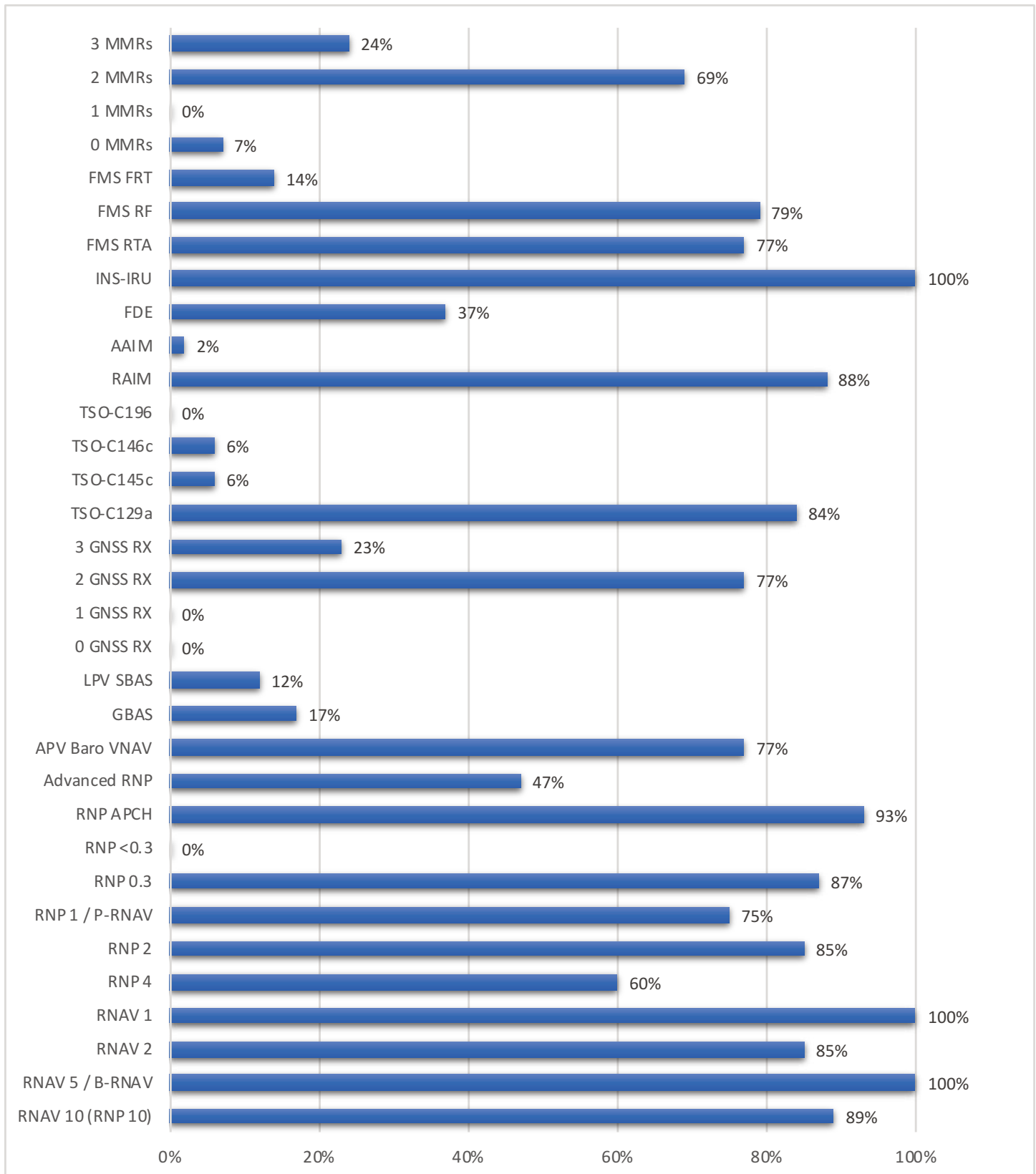




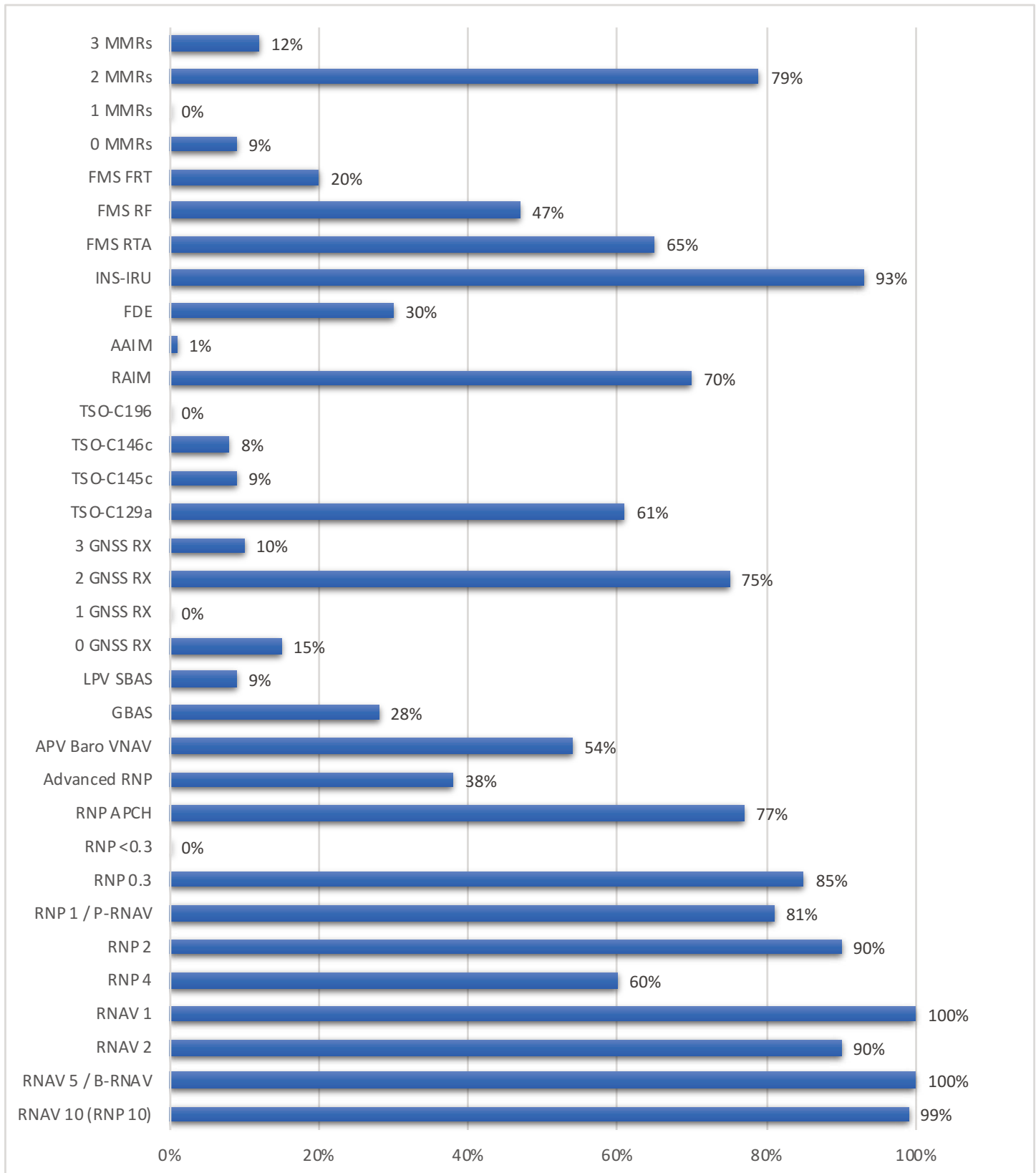
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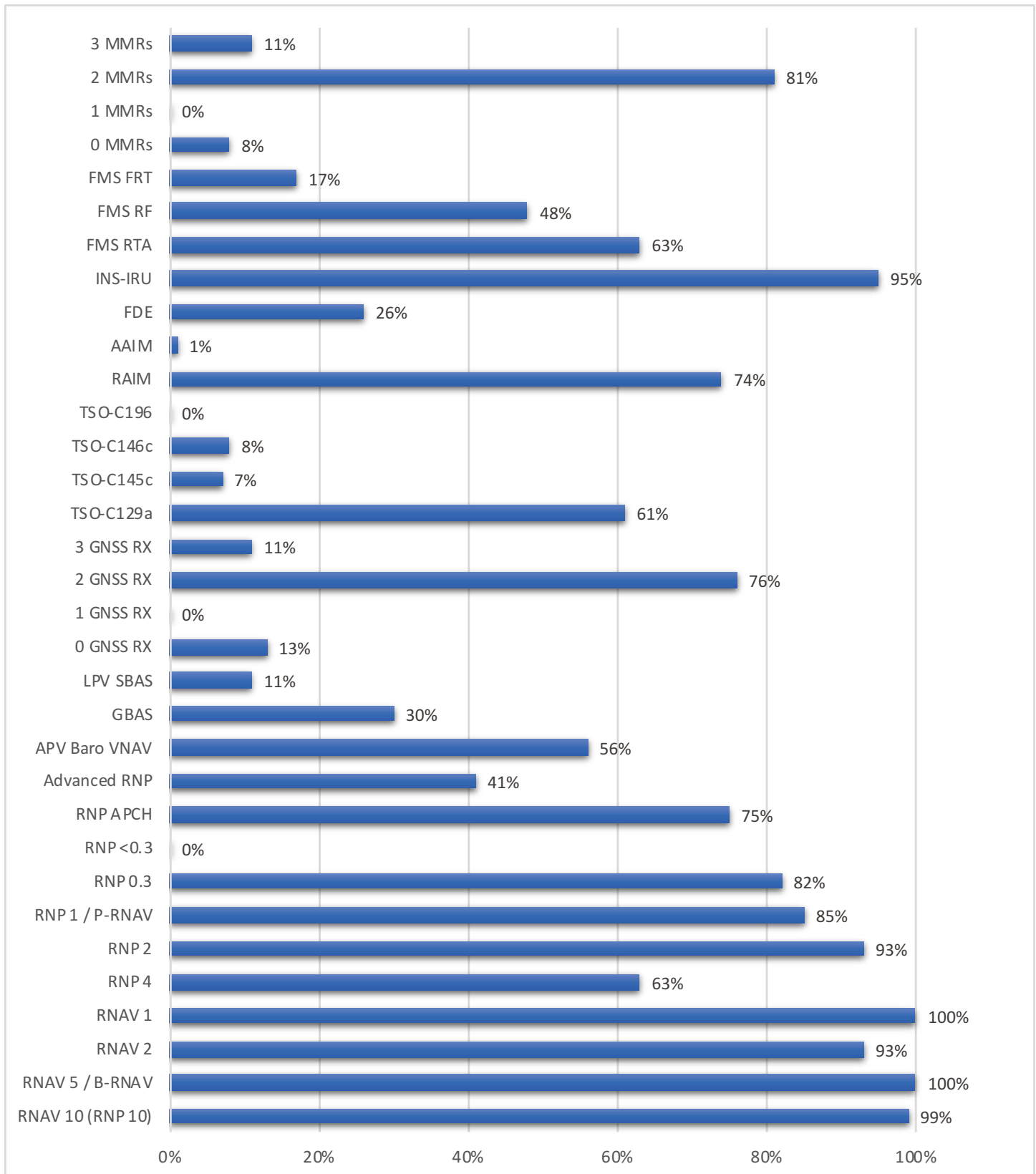




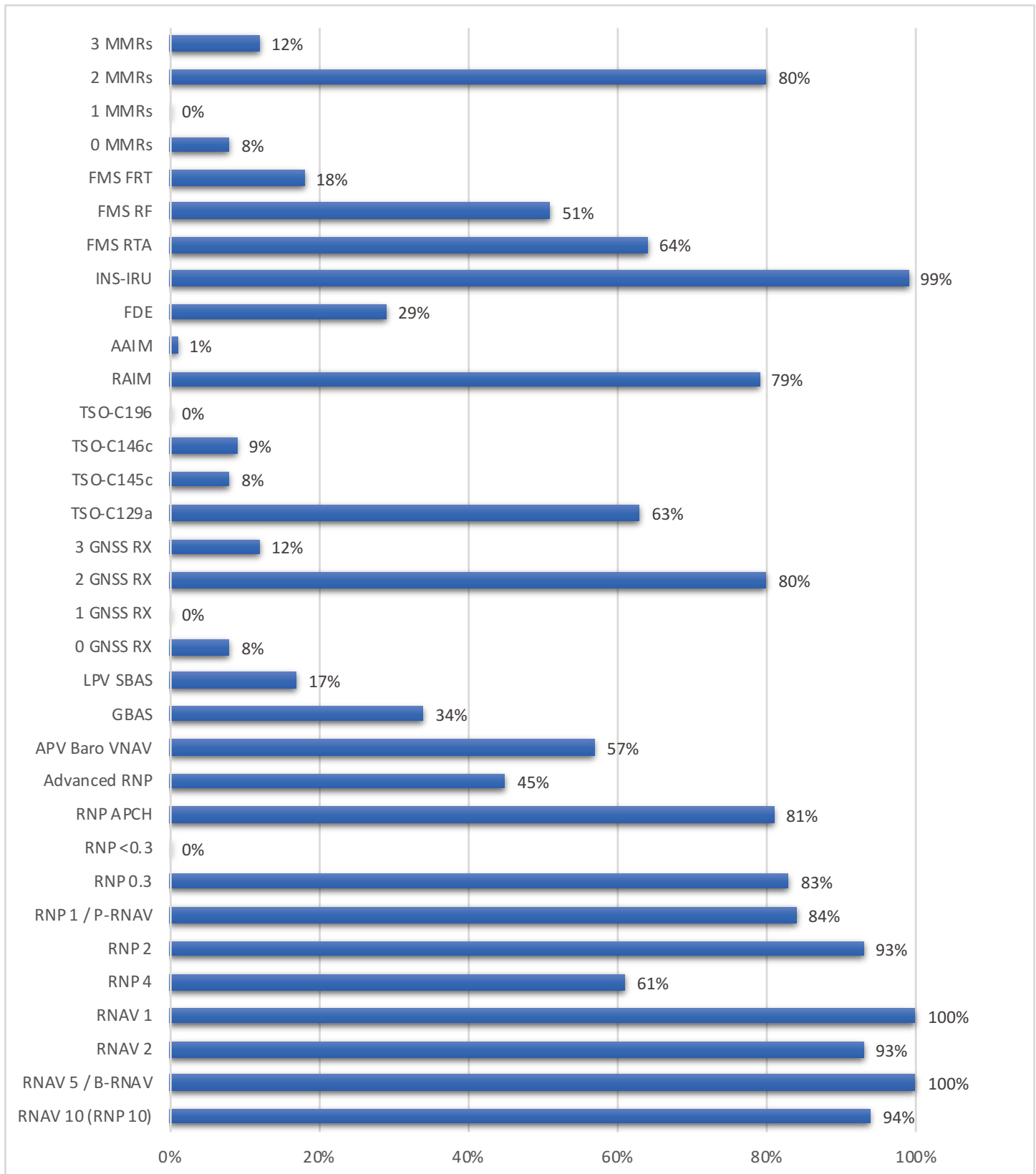
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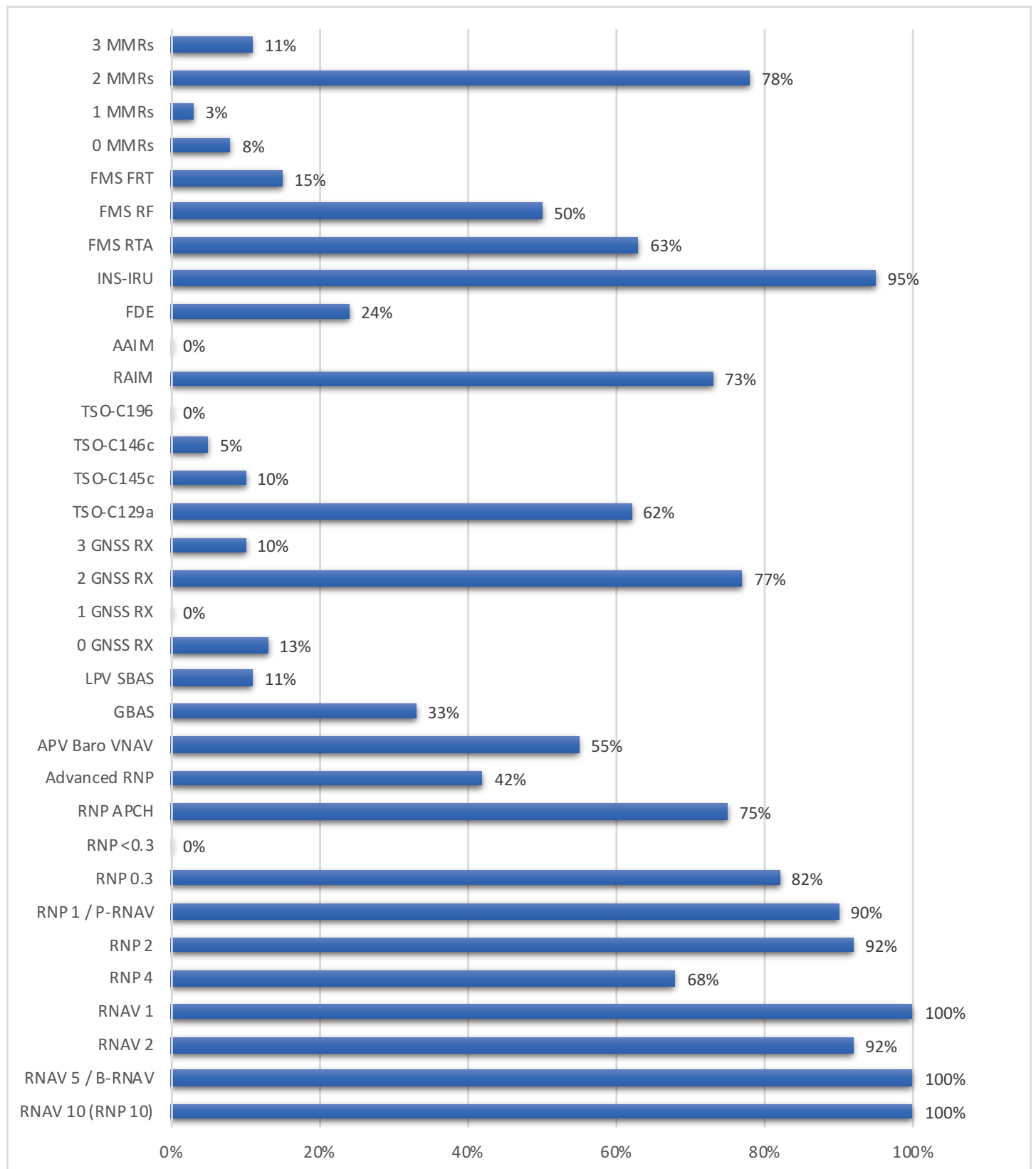


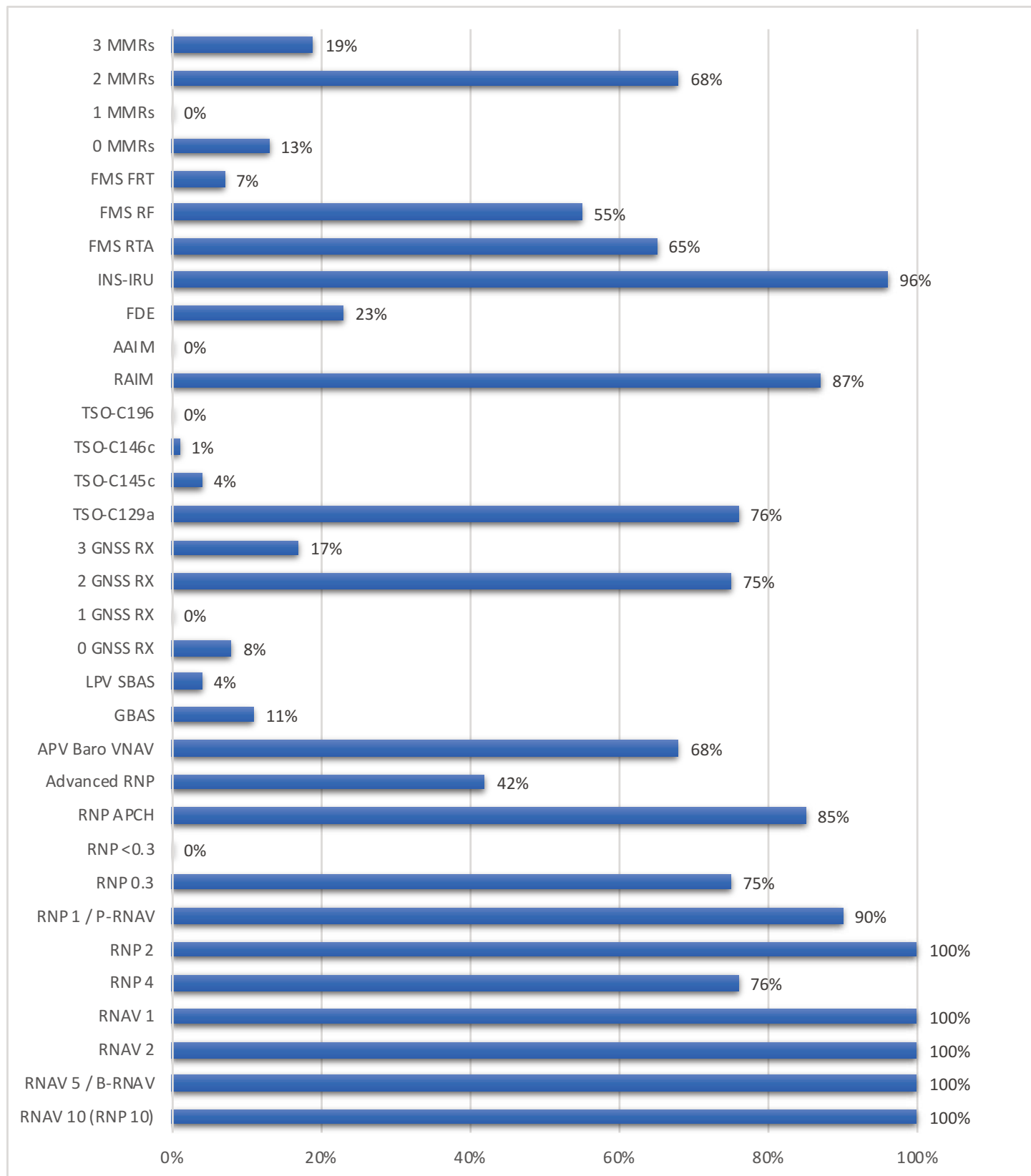
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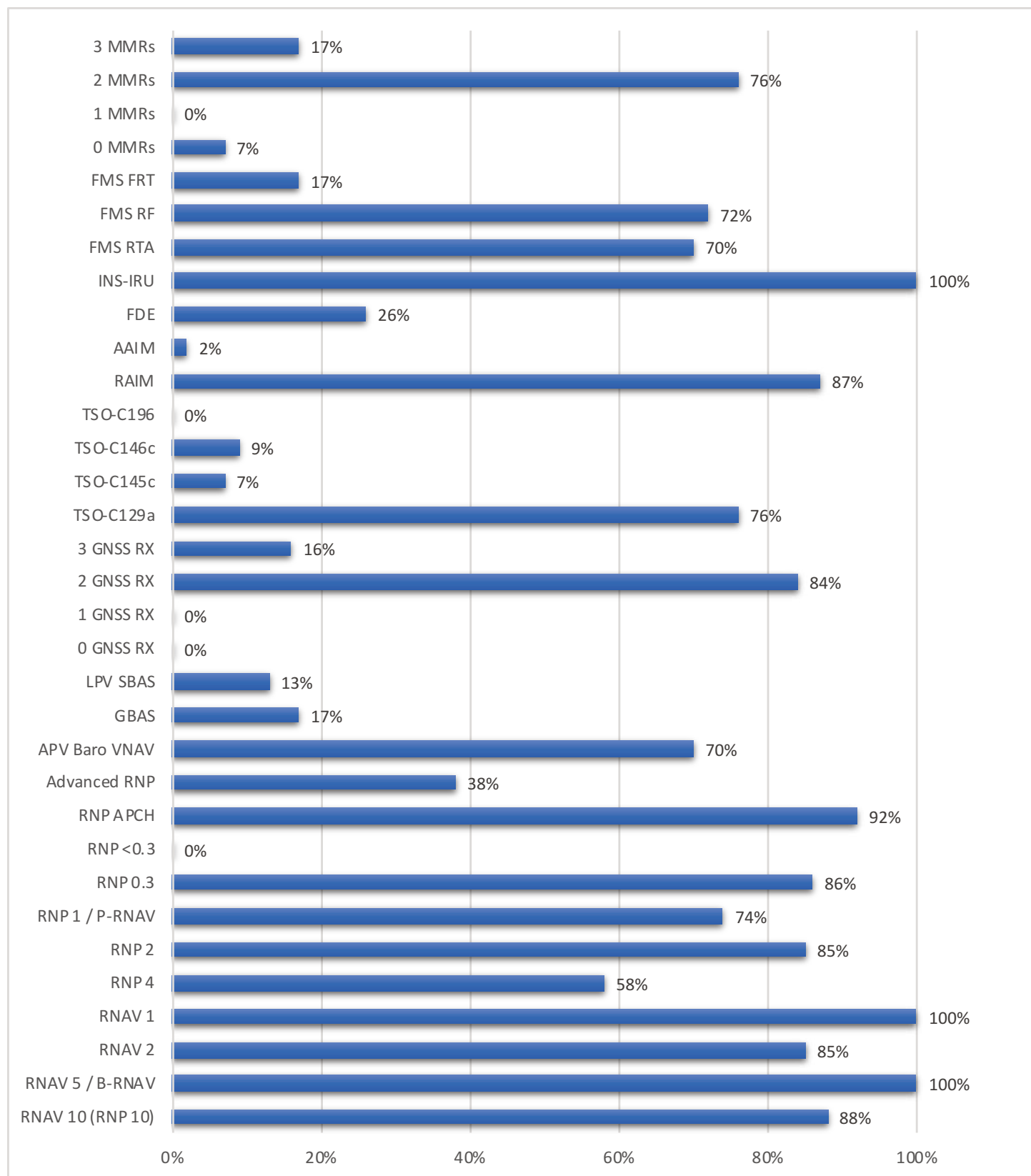


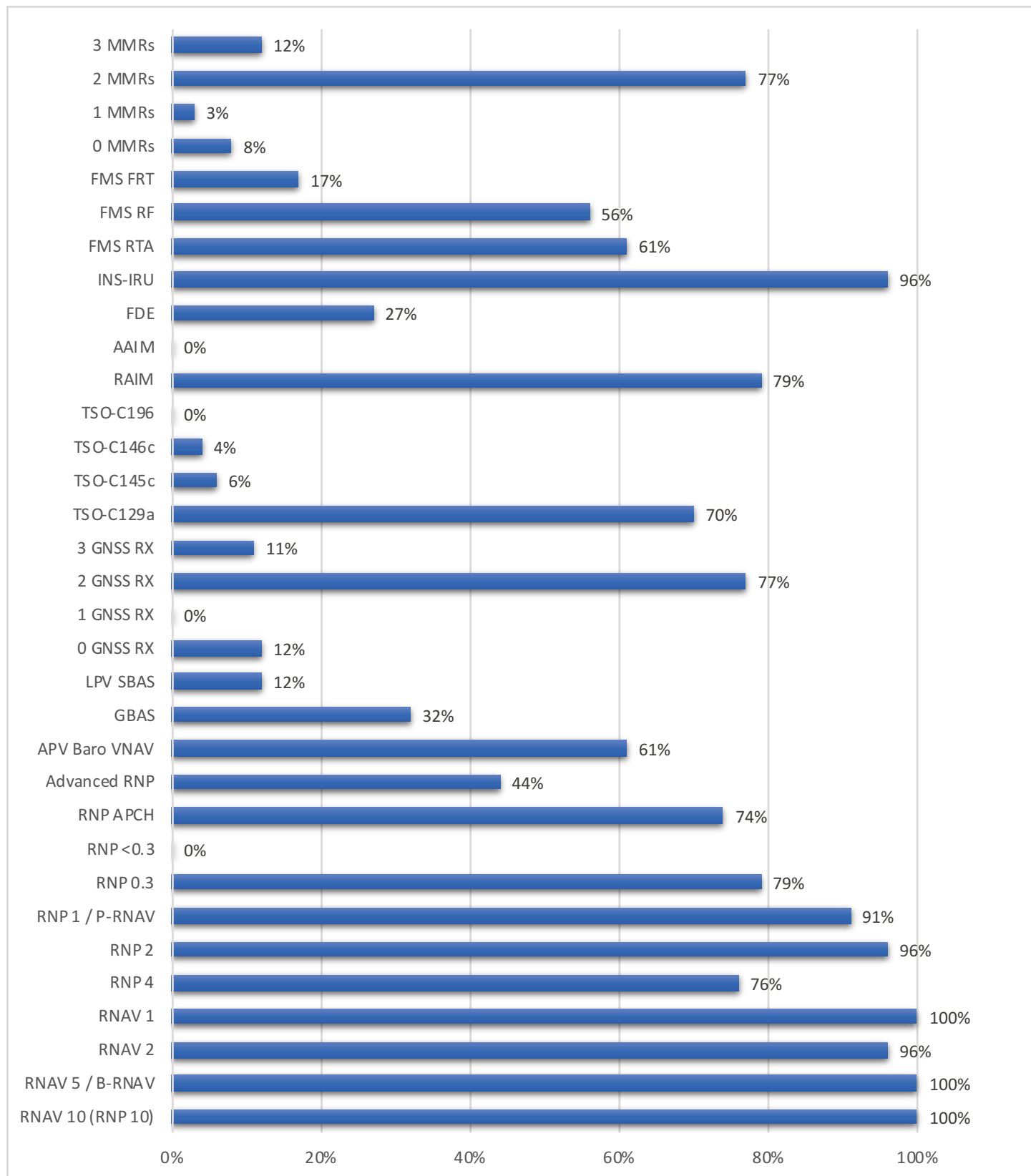
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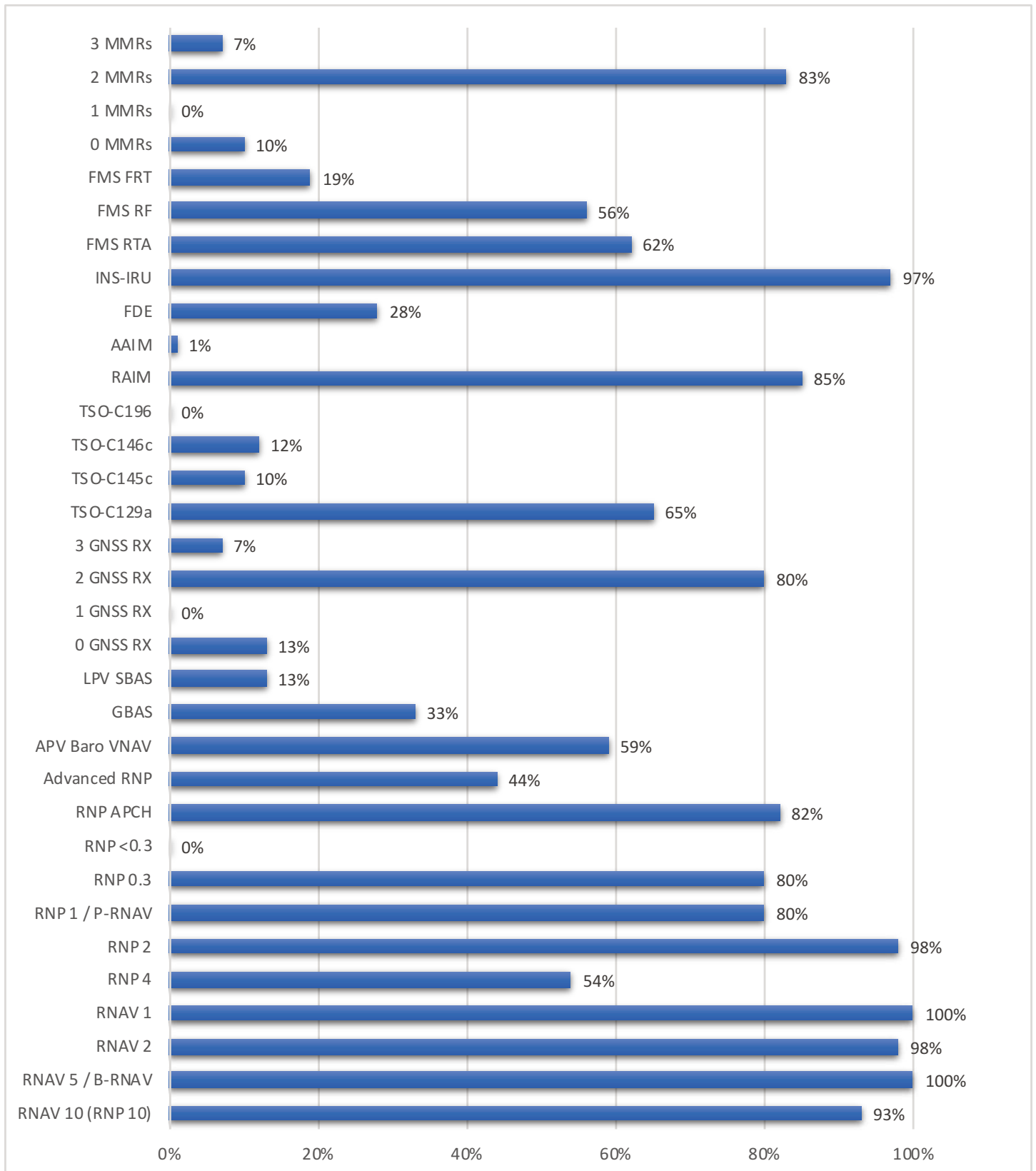




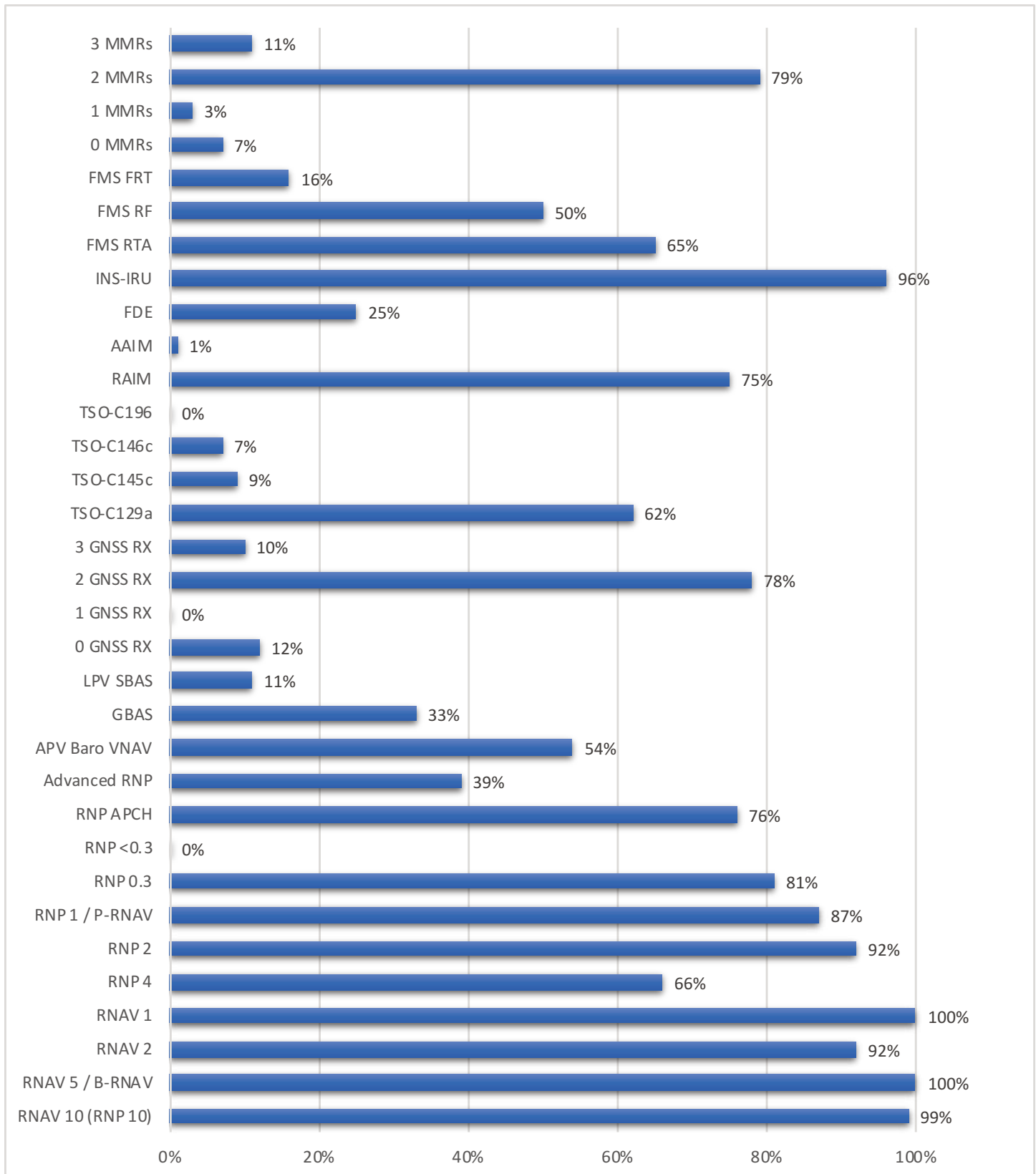




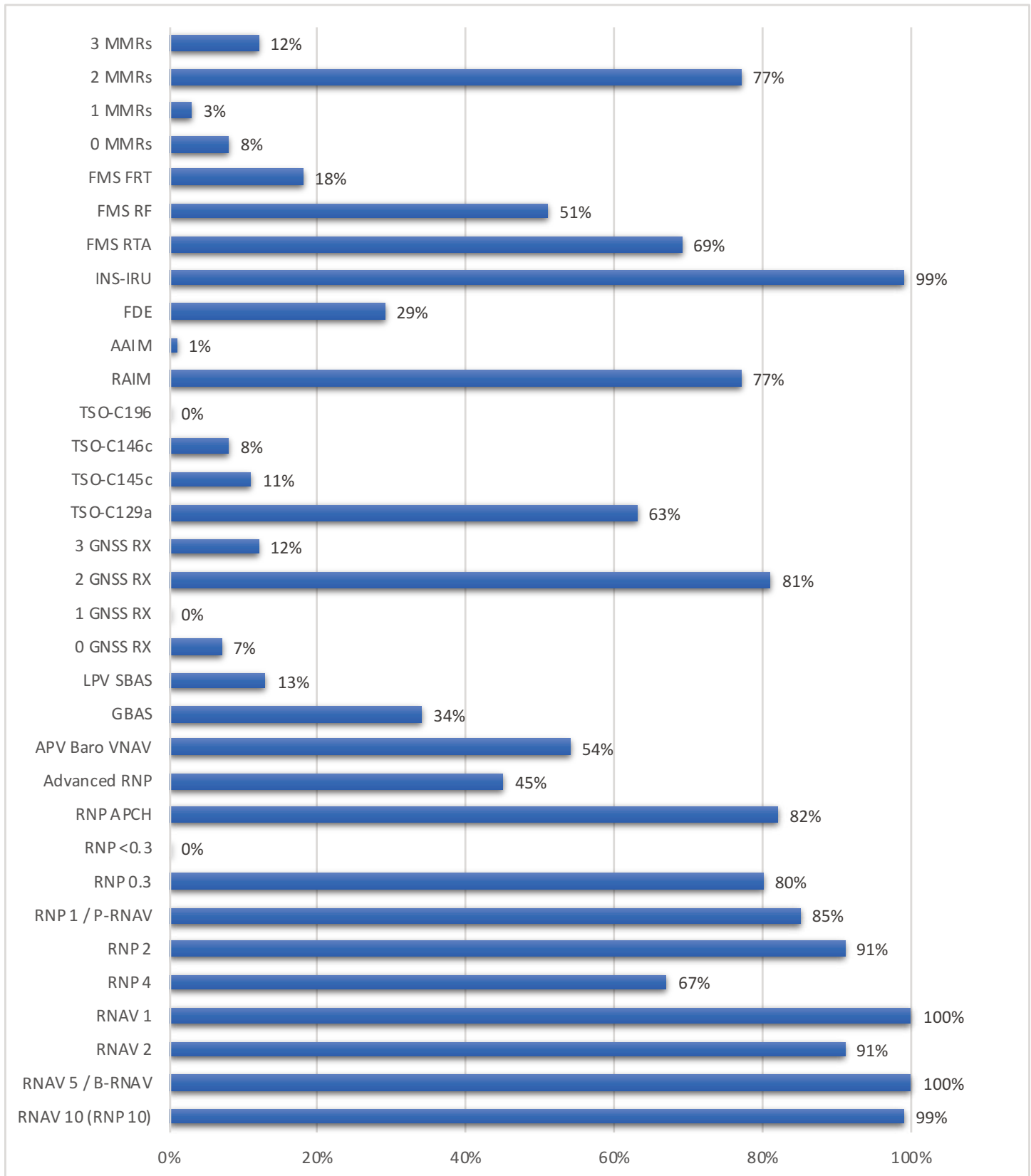




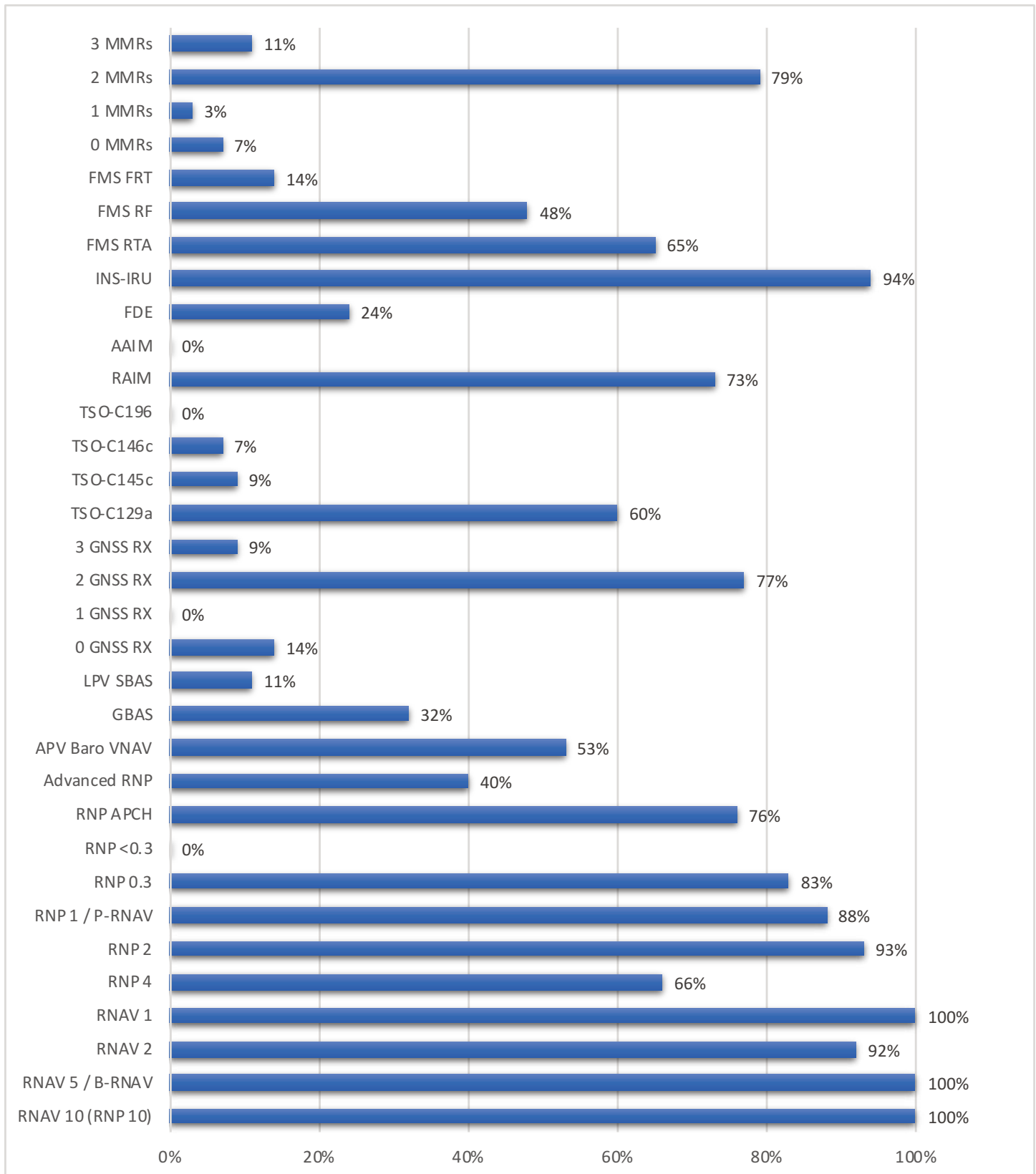
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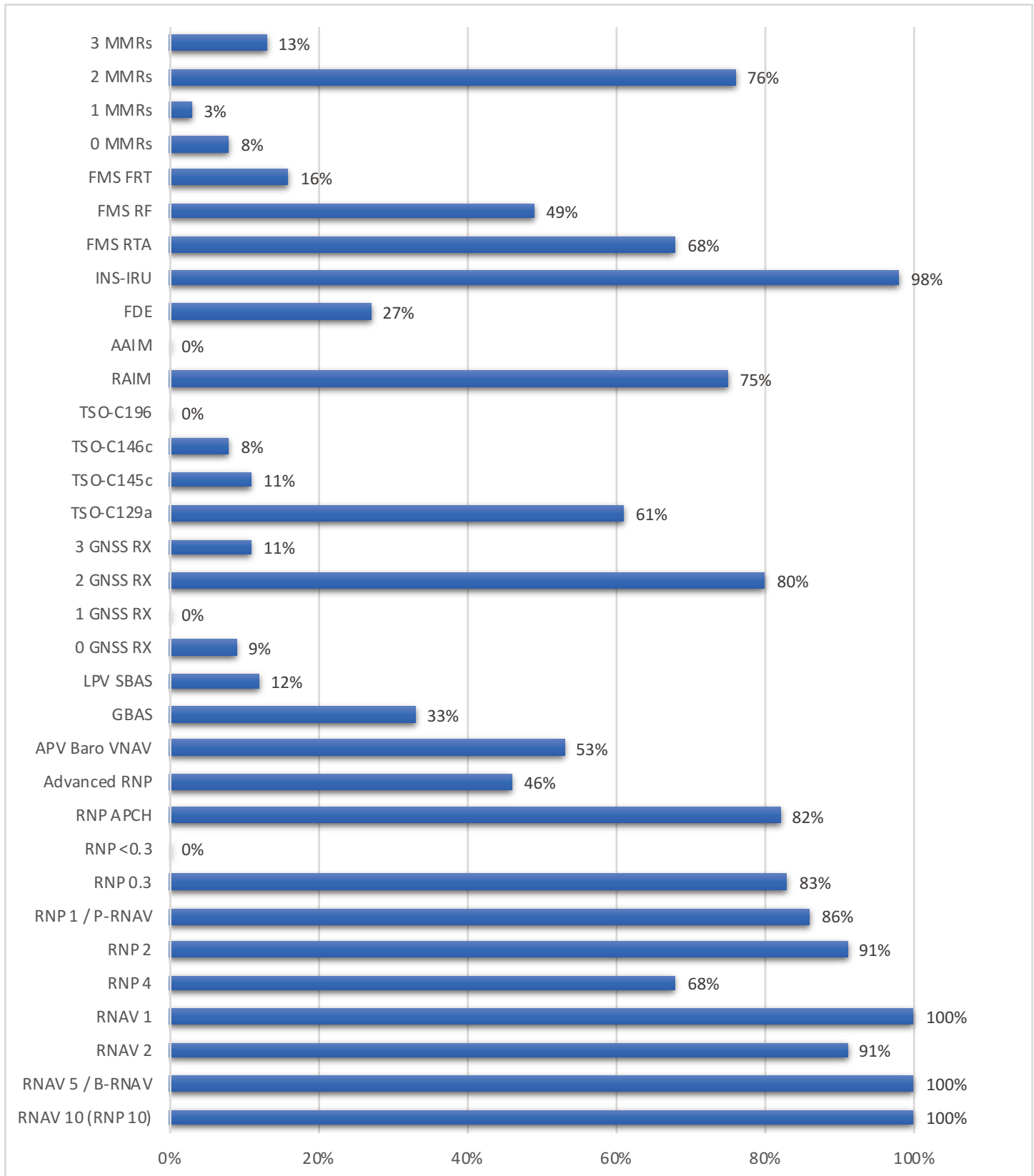
New York Oceanic



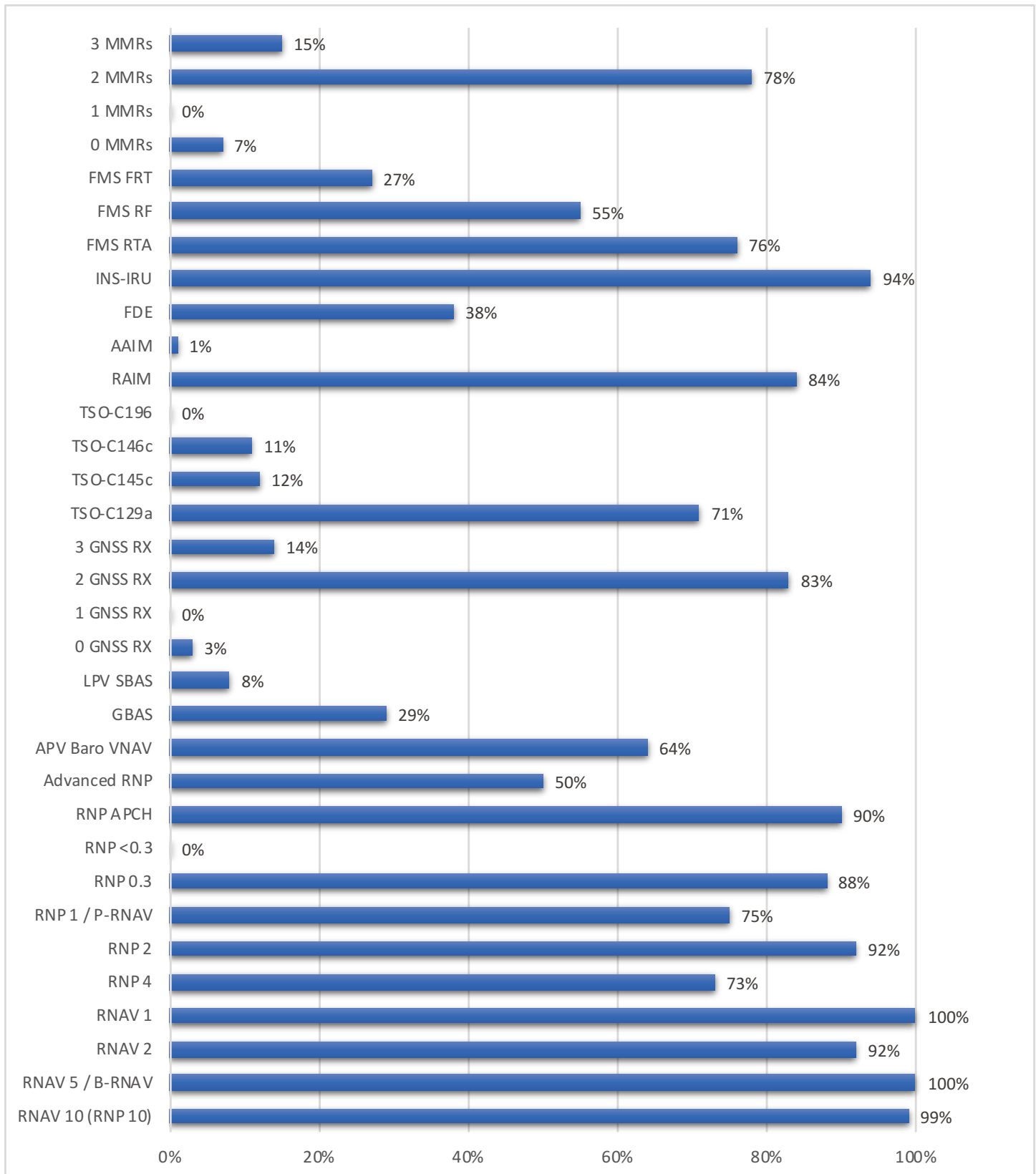
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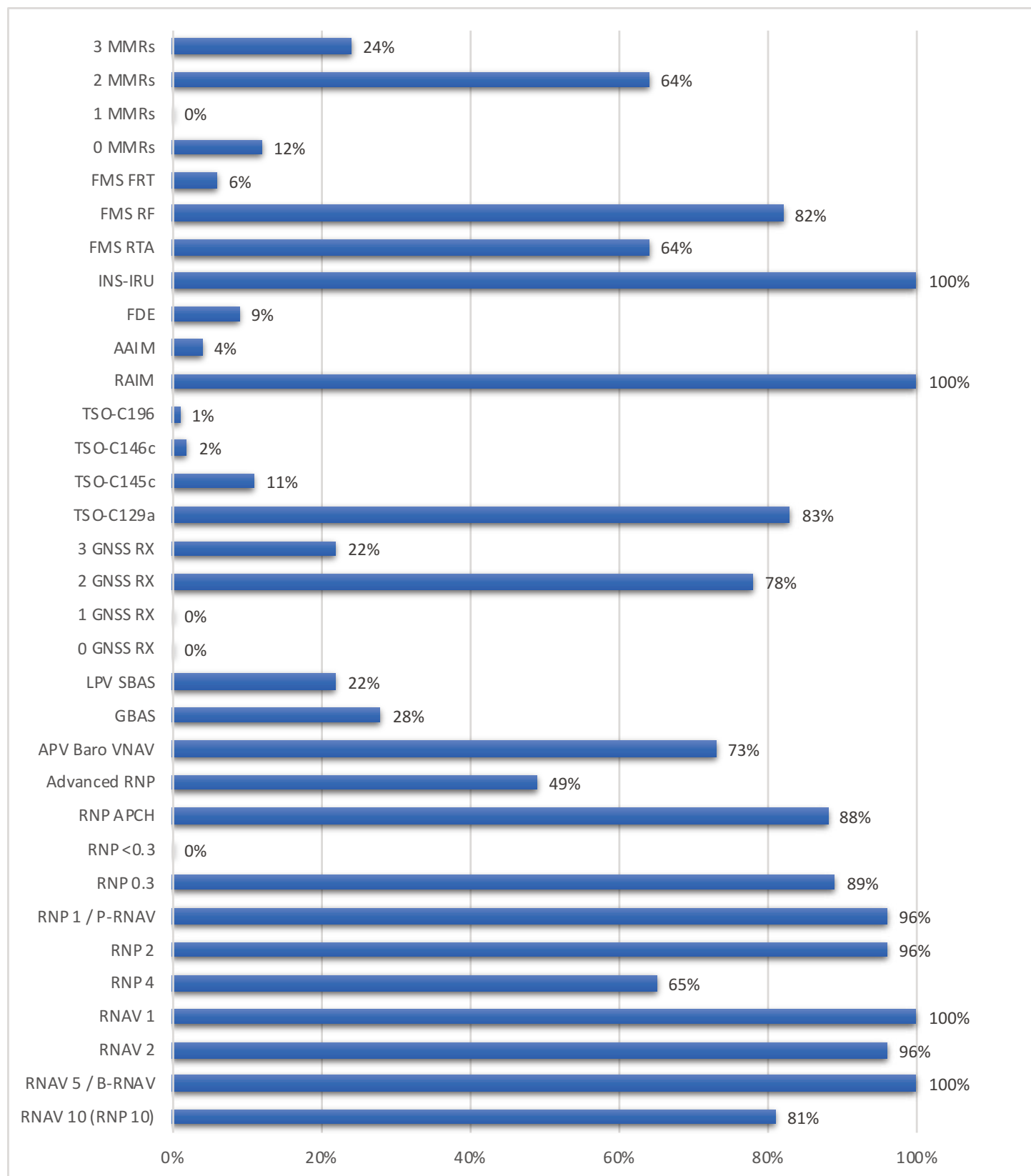


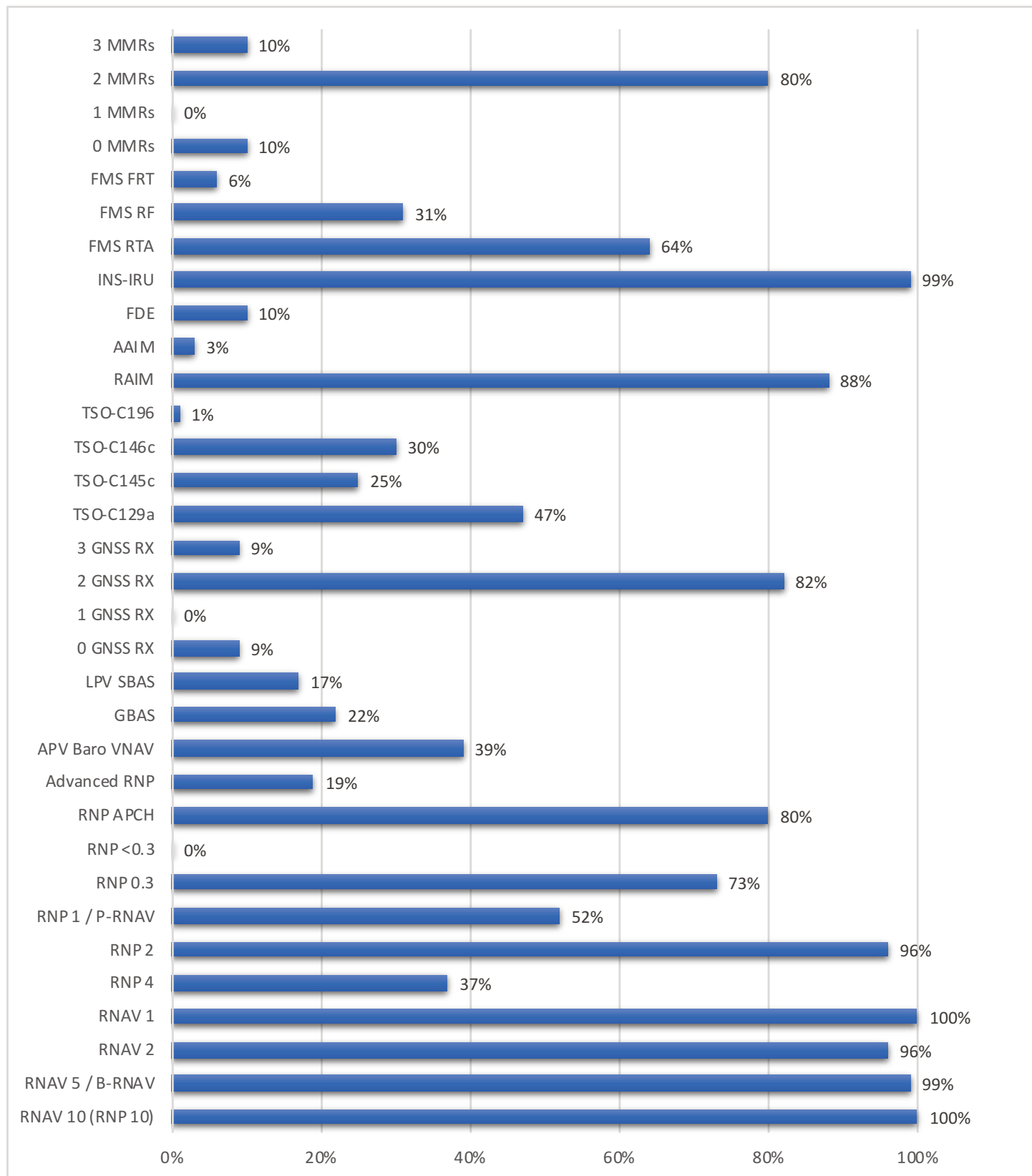
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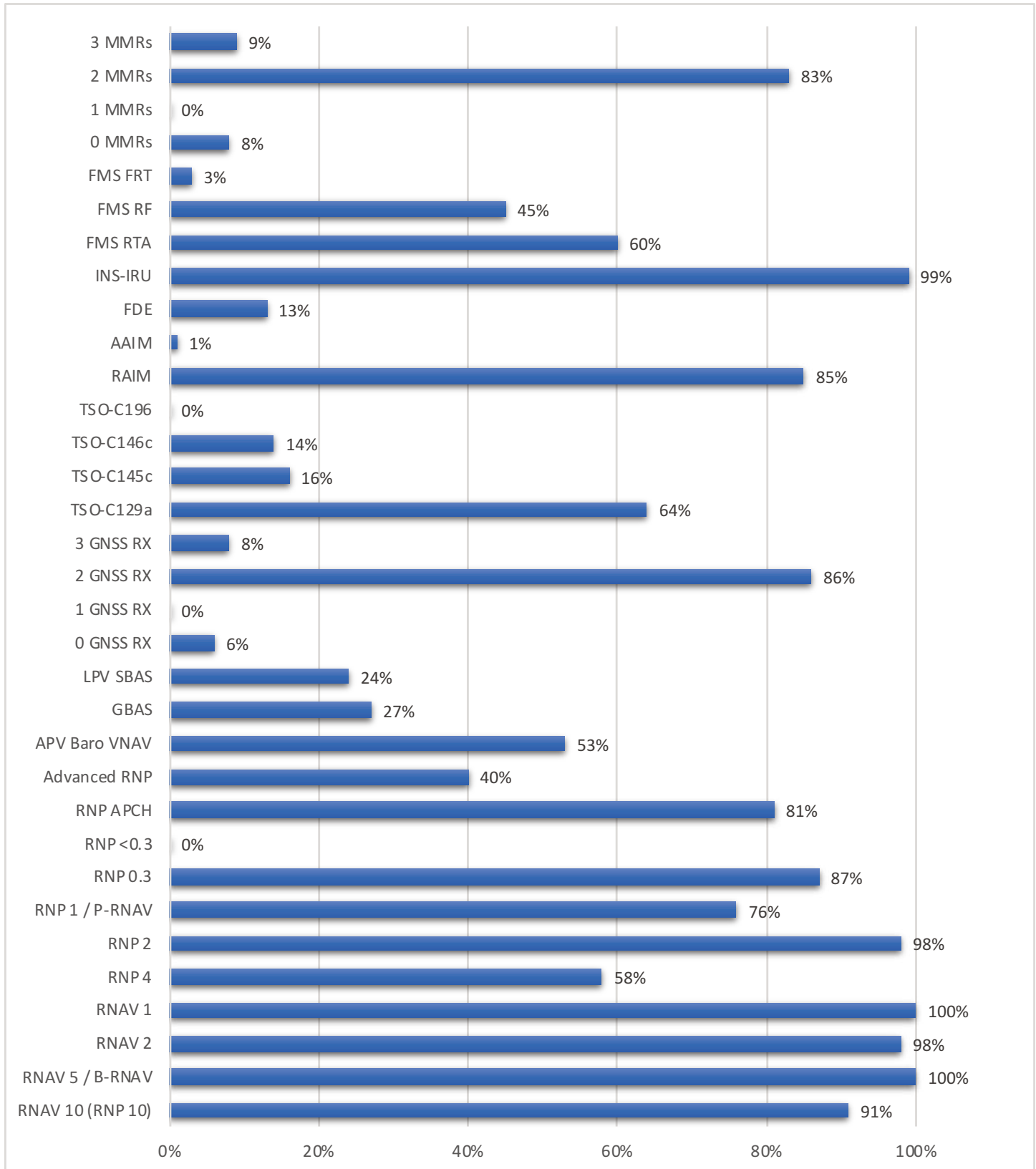
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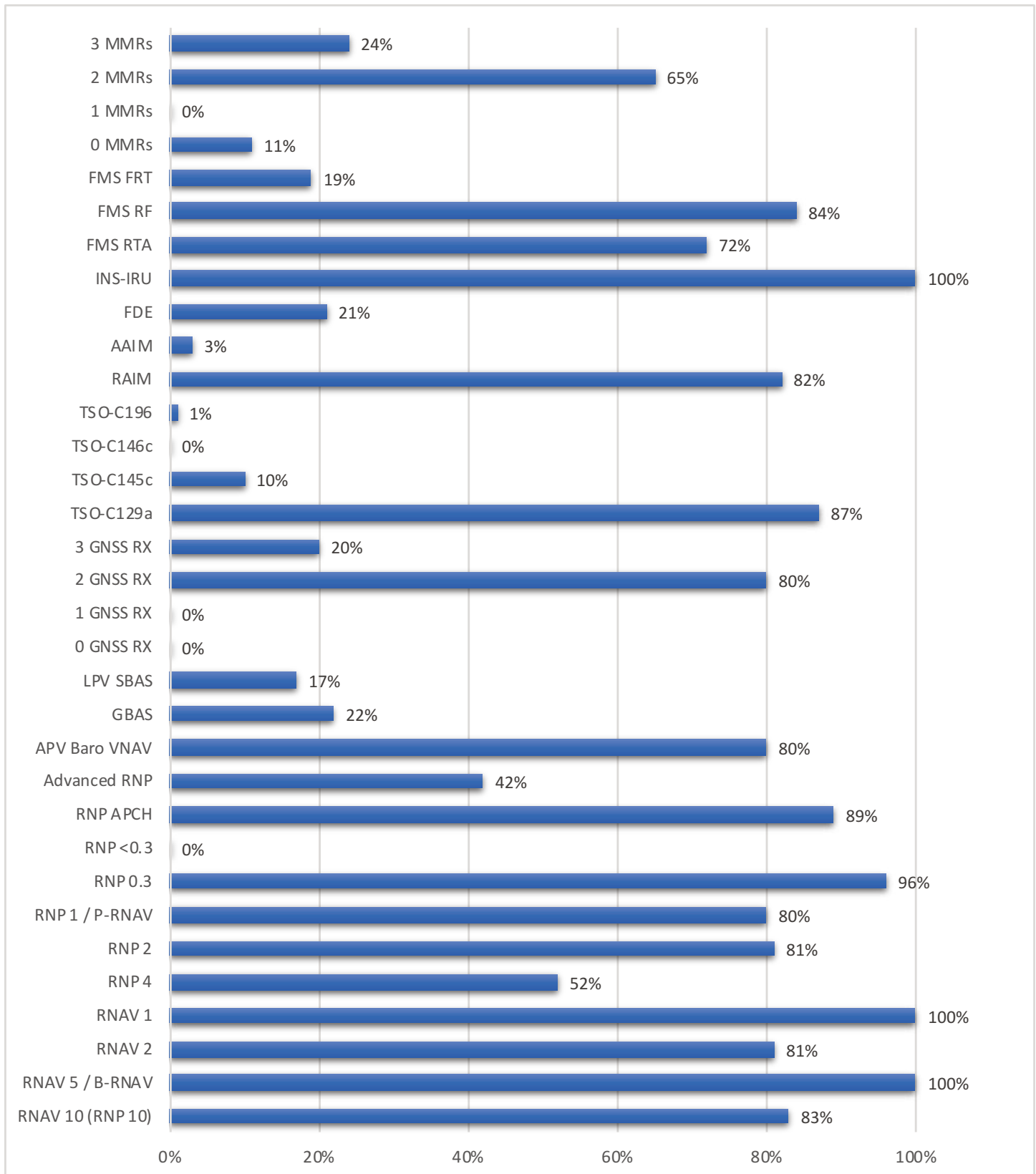




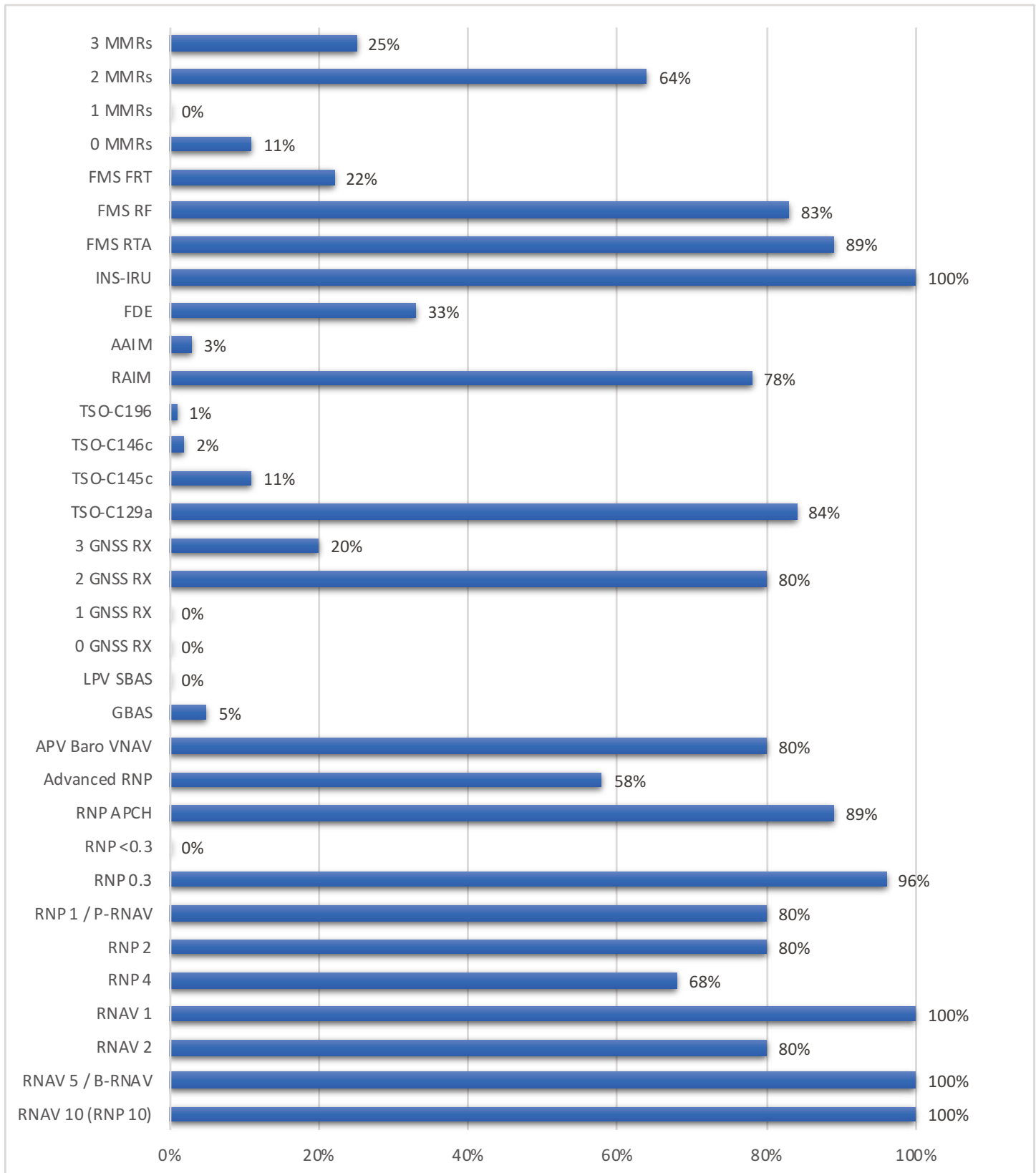
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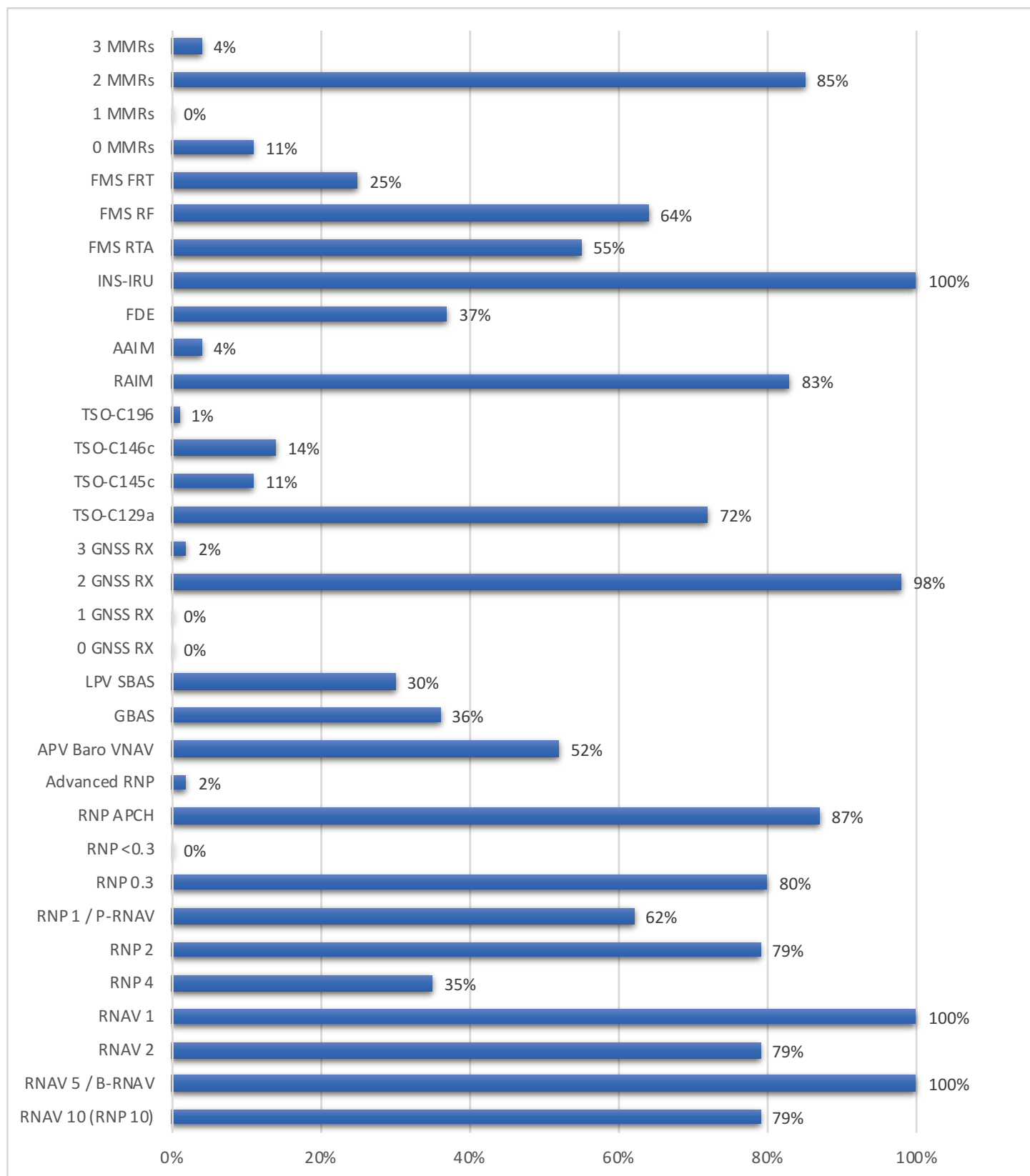


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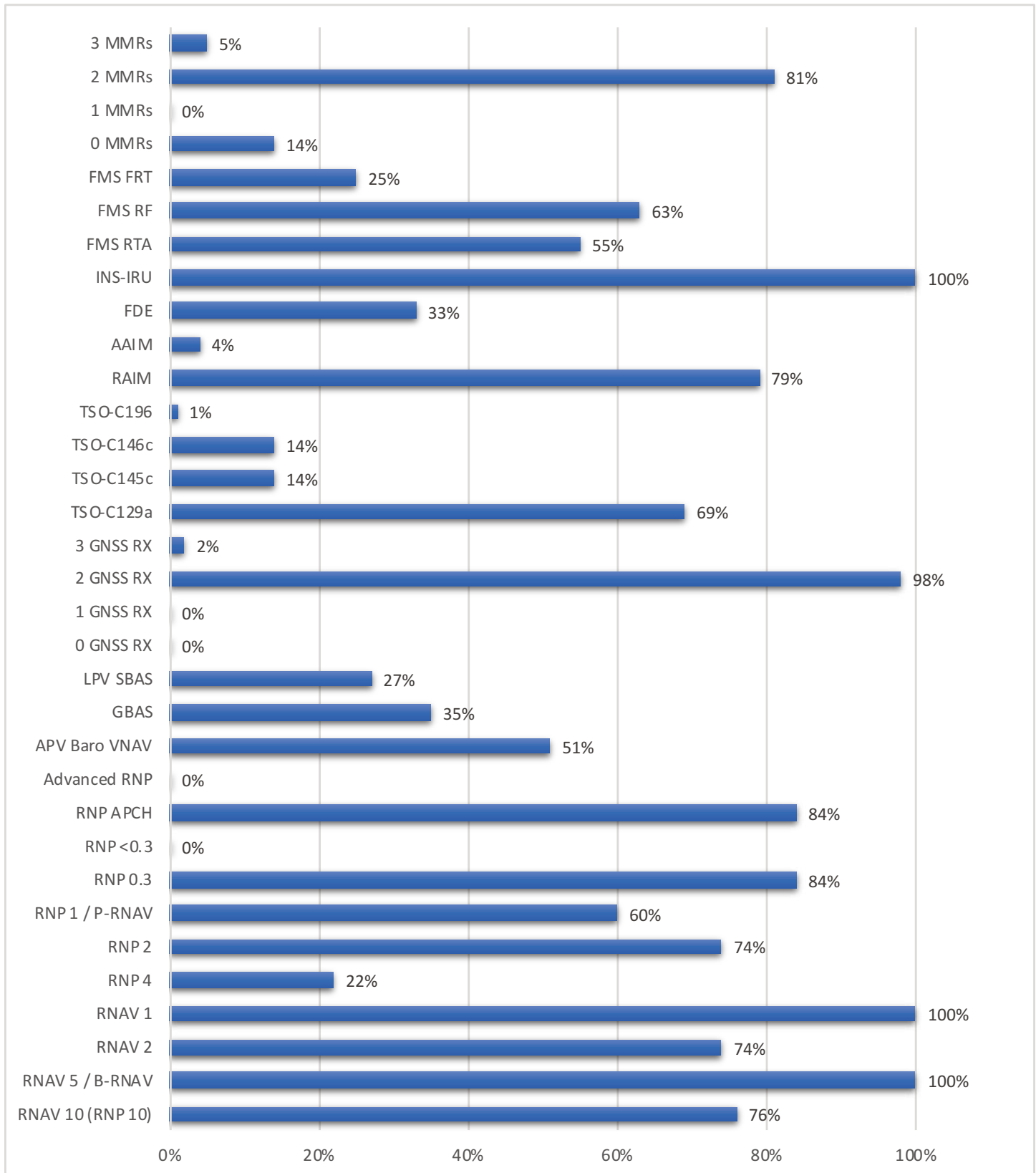


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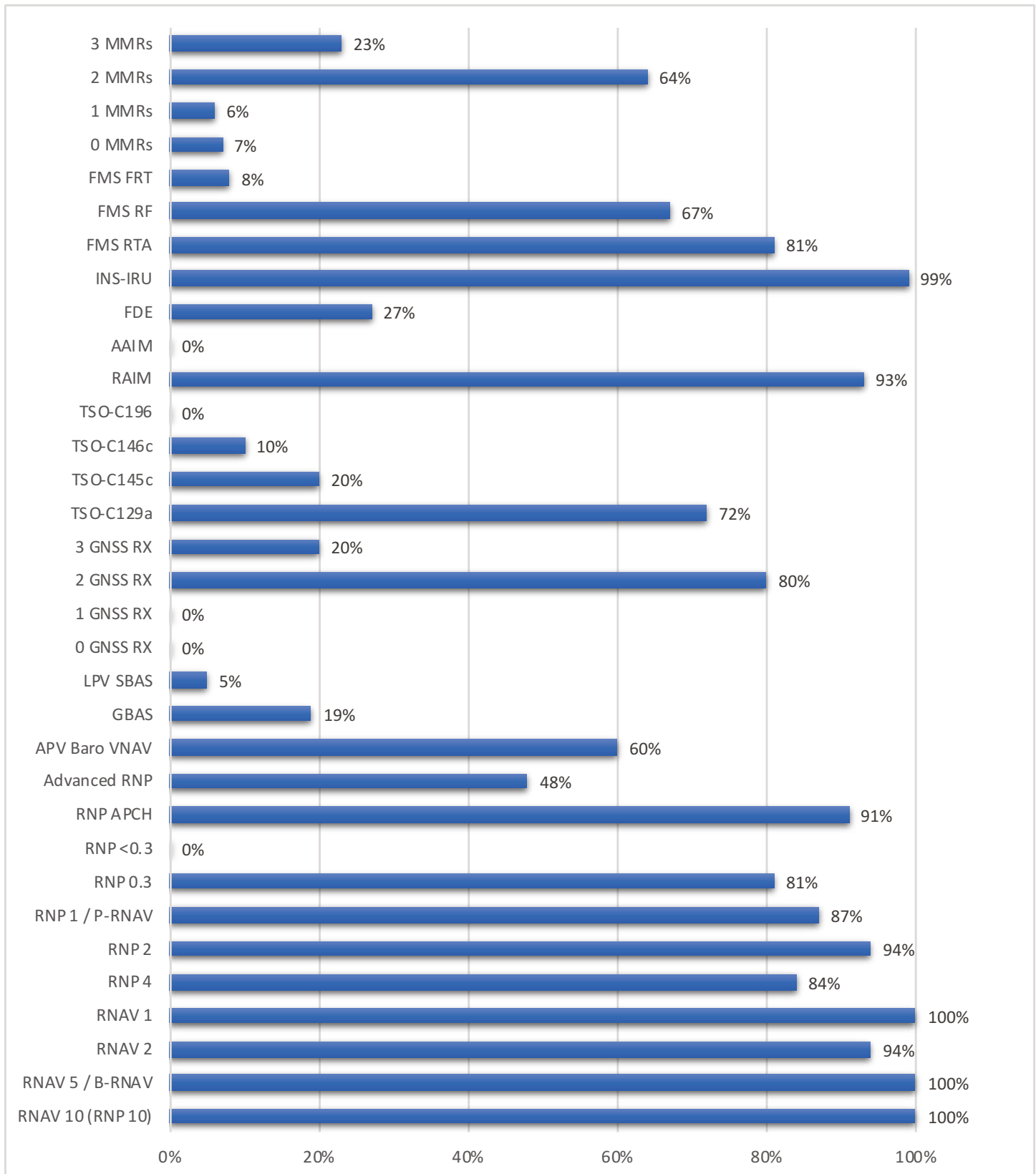


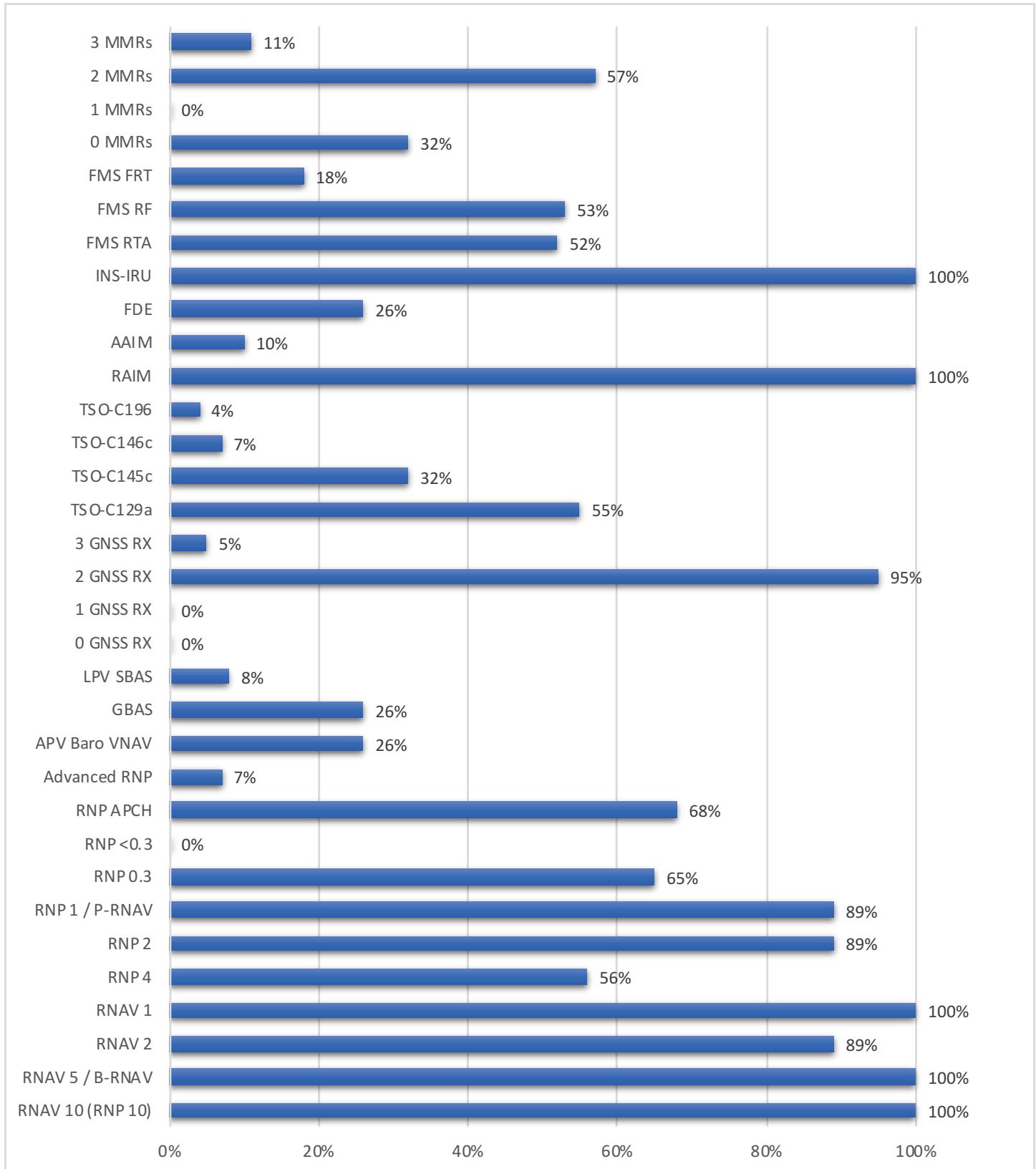


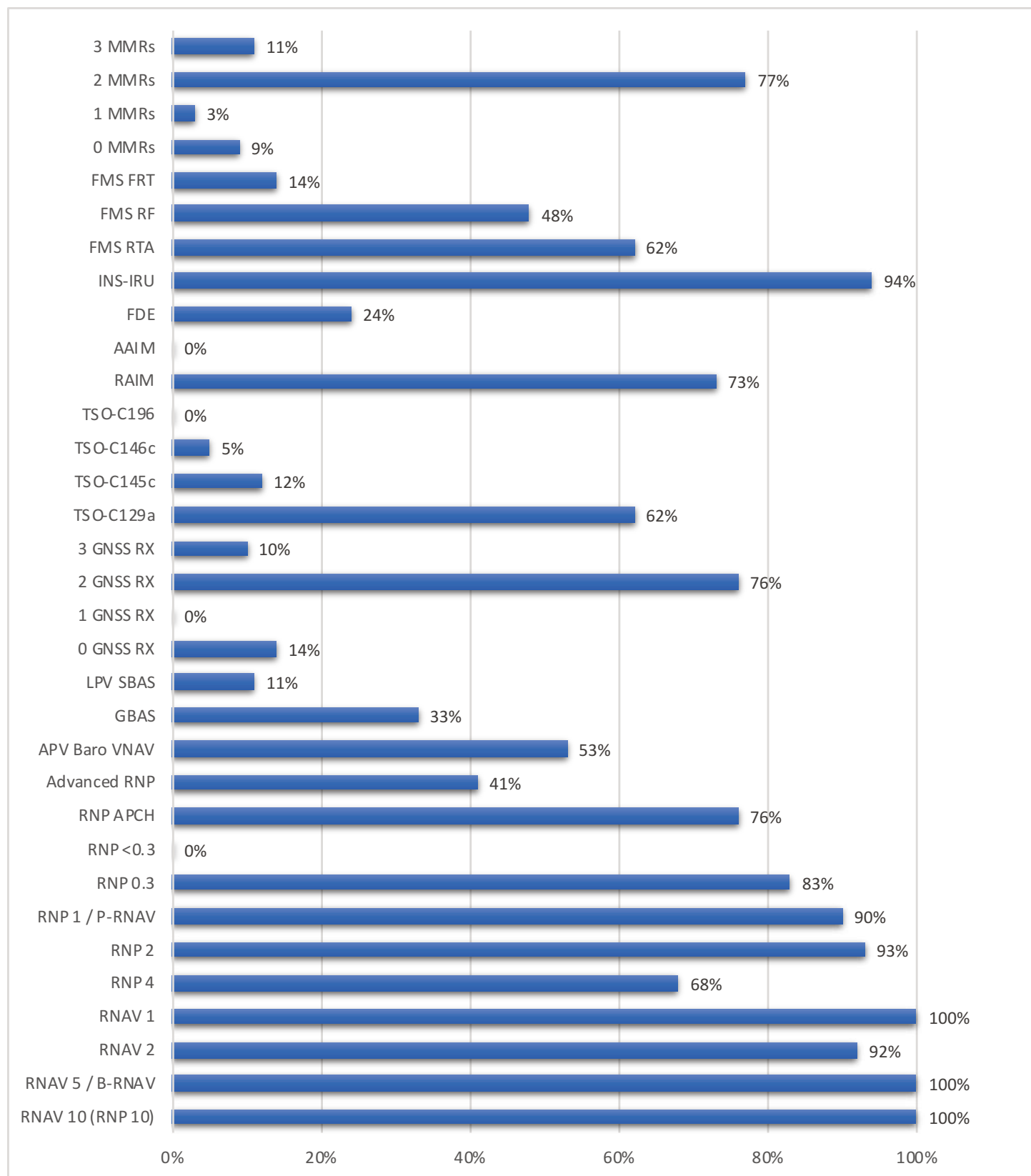
Resistencia



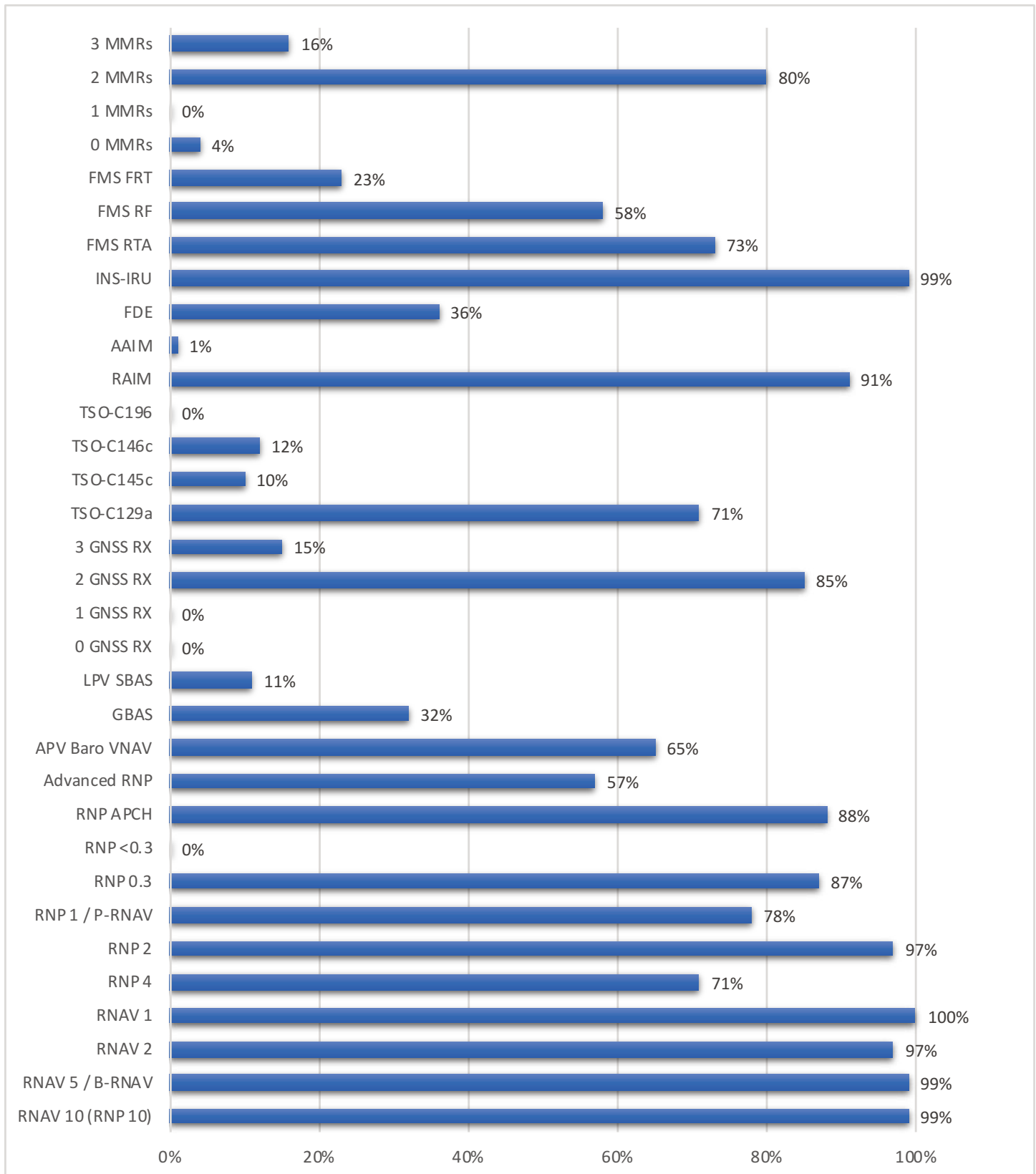
Reykjavik Oceanic



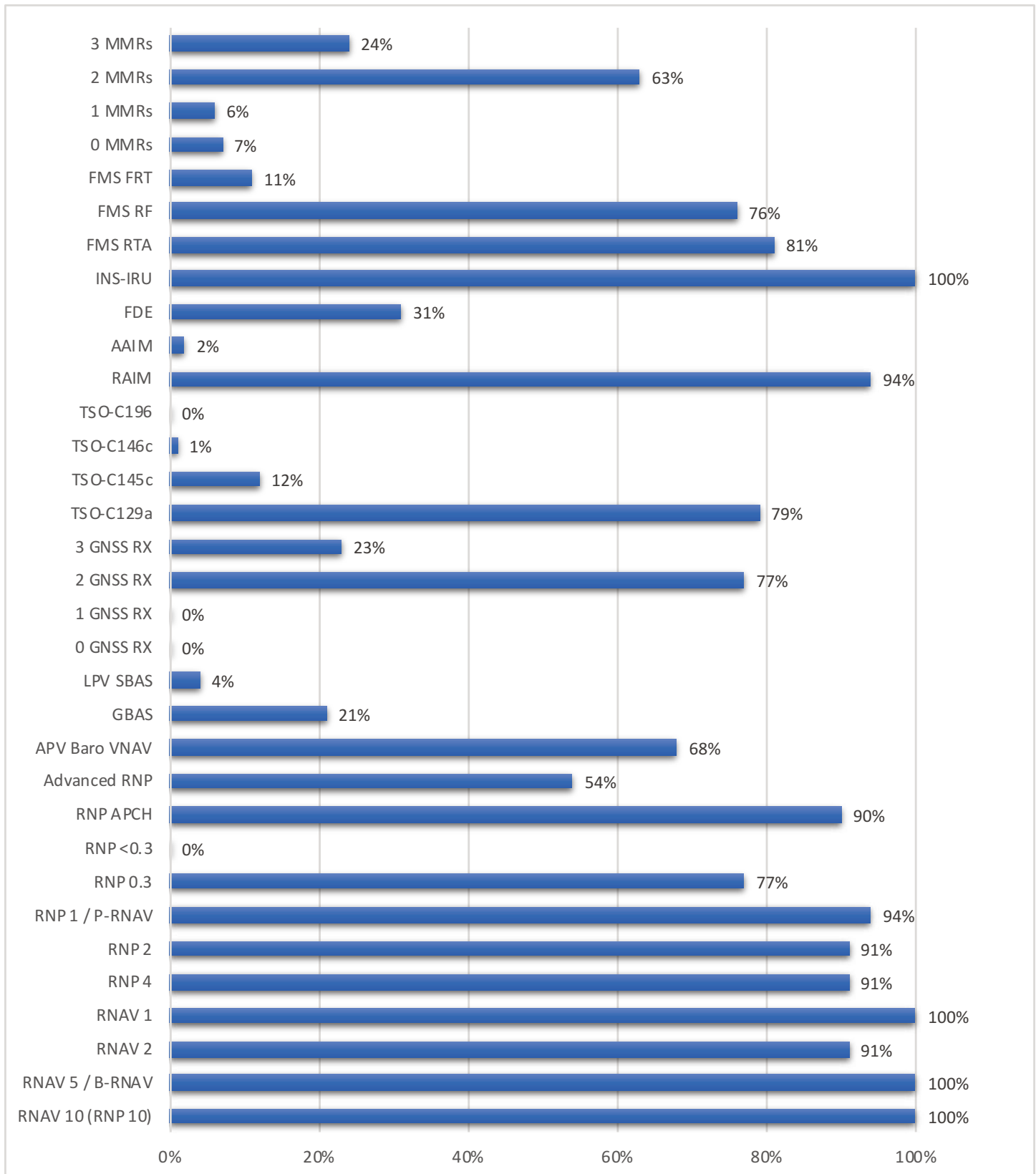


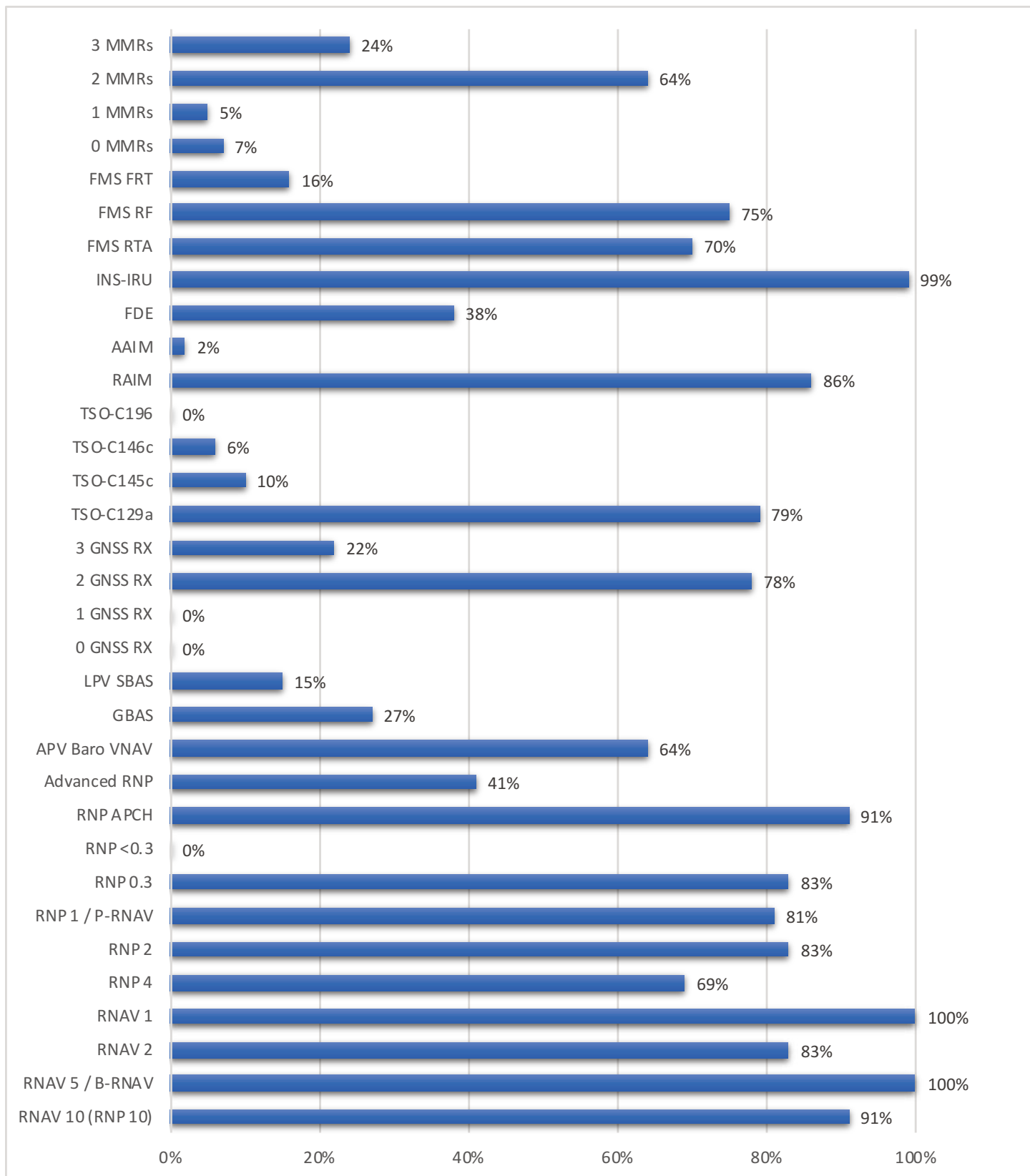


San Juan

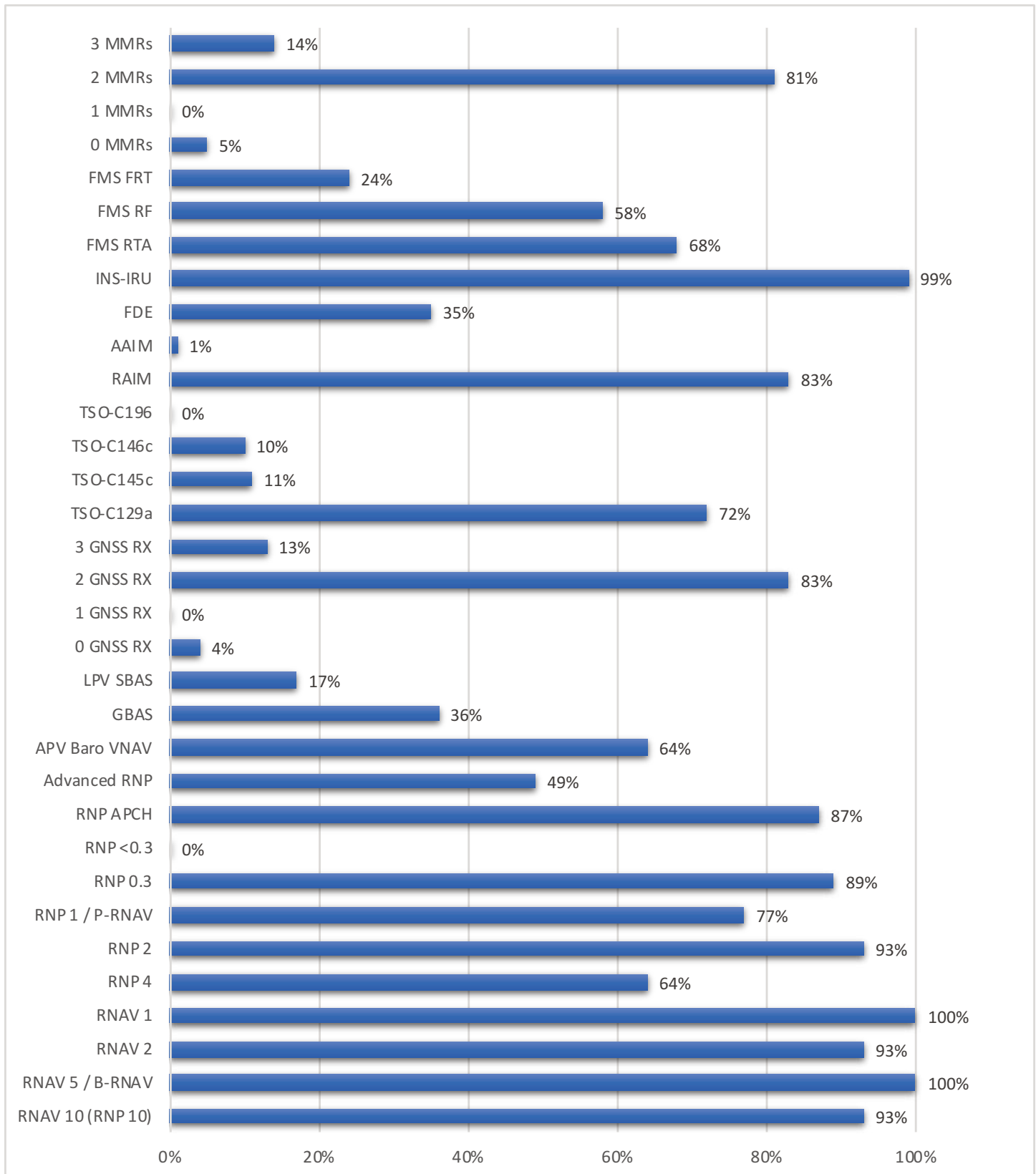


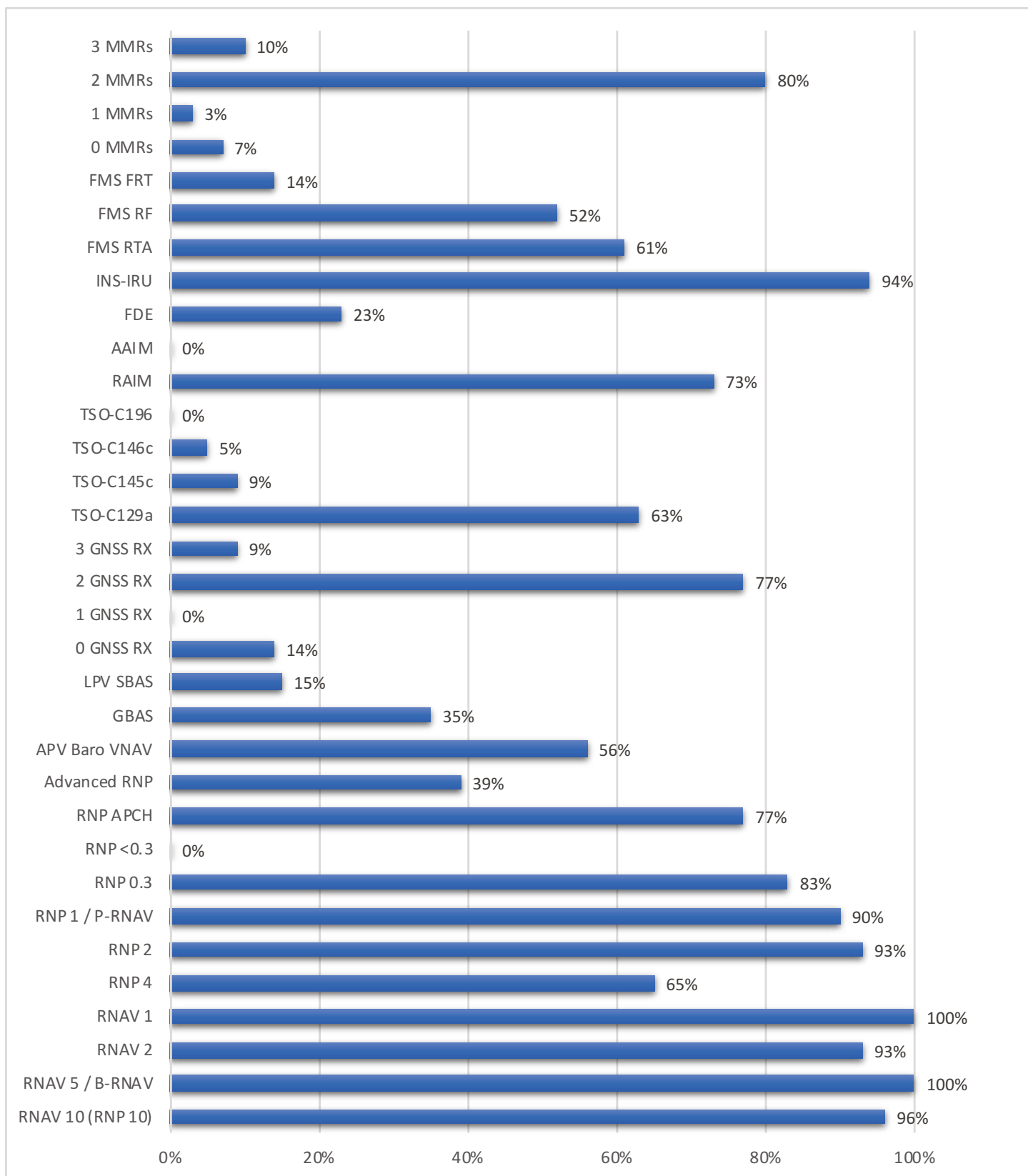
Santa Maria Oceanic



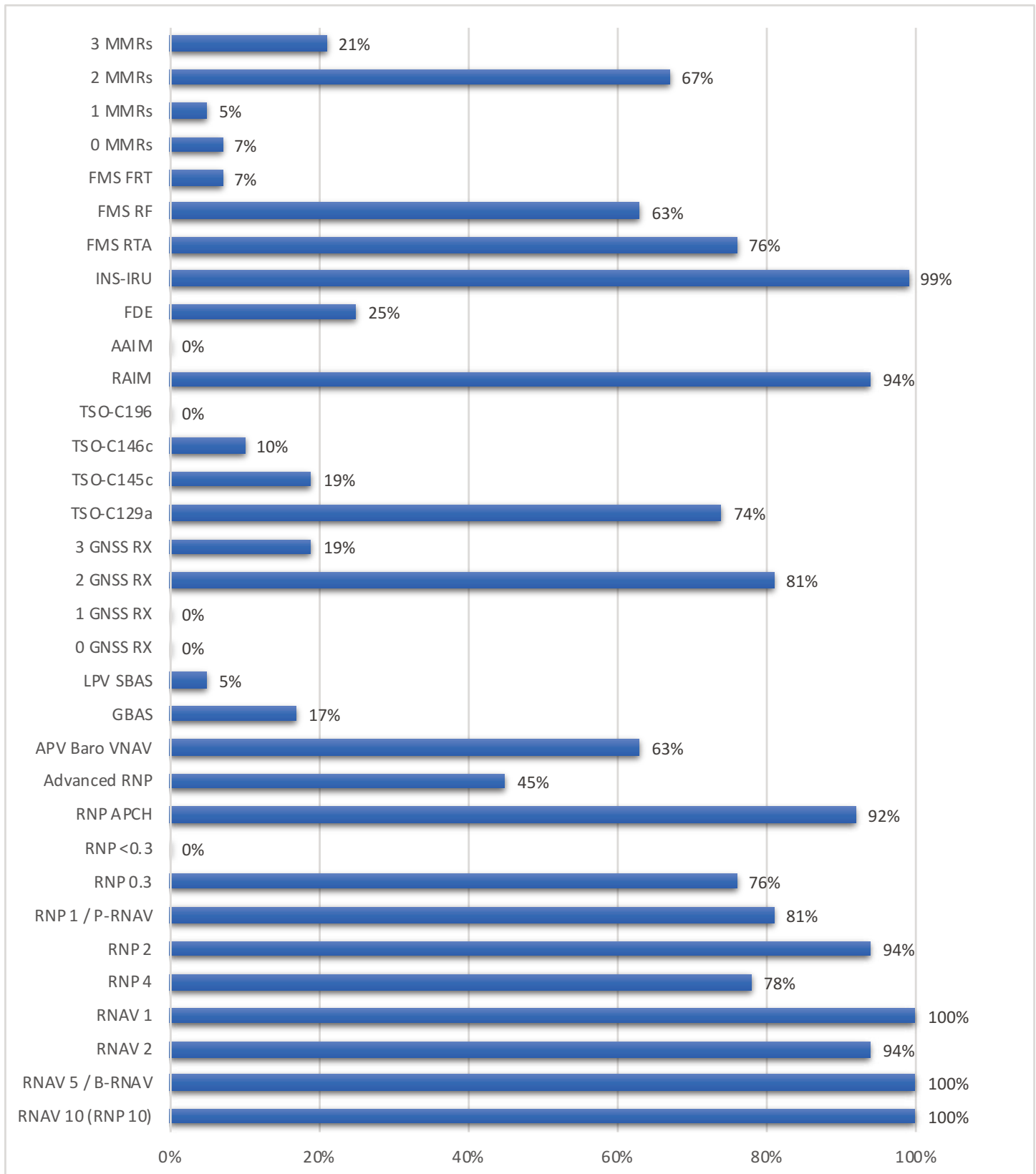


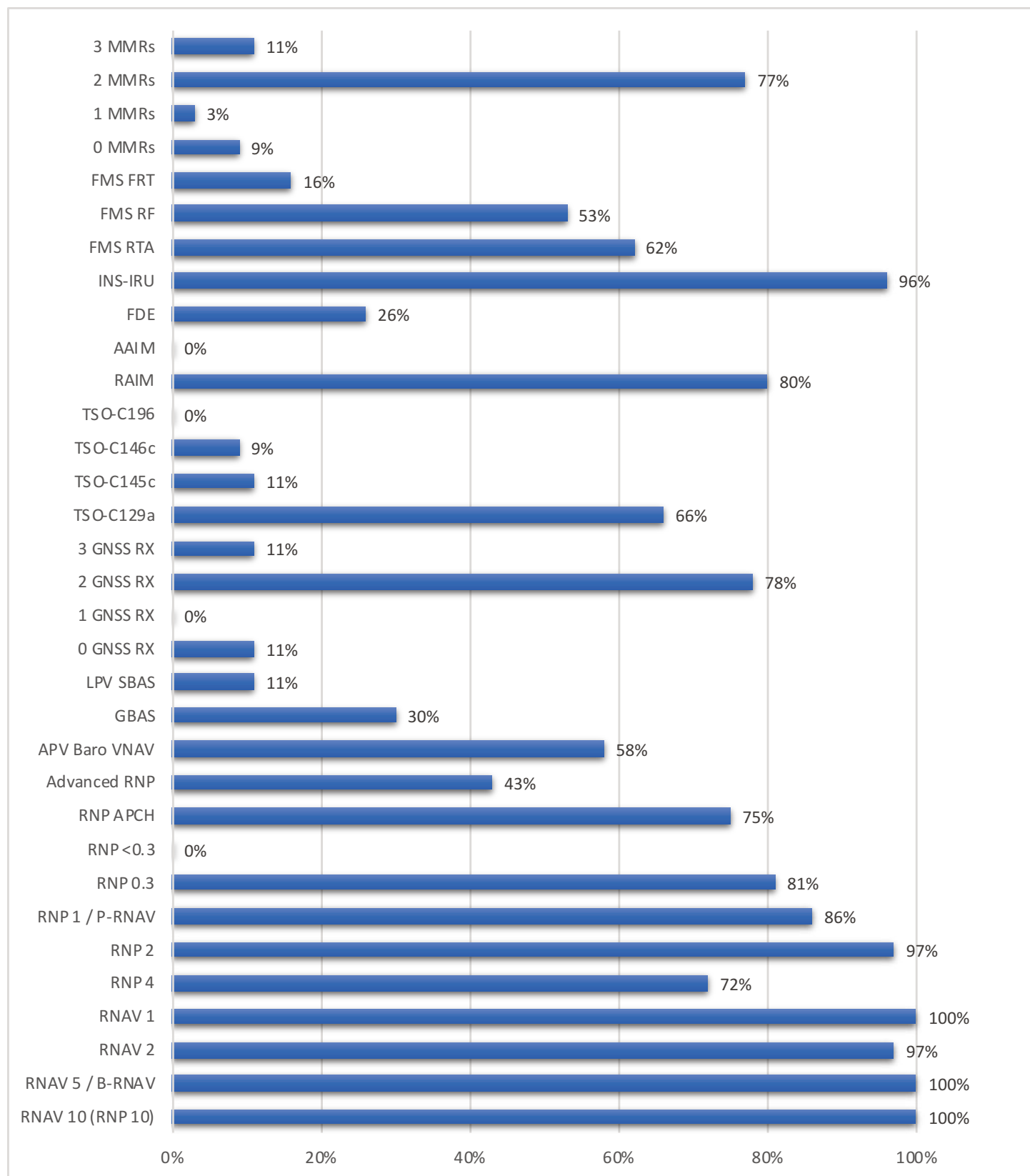
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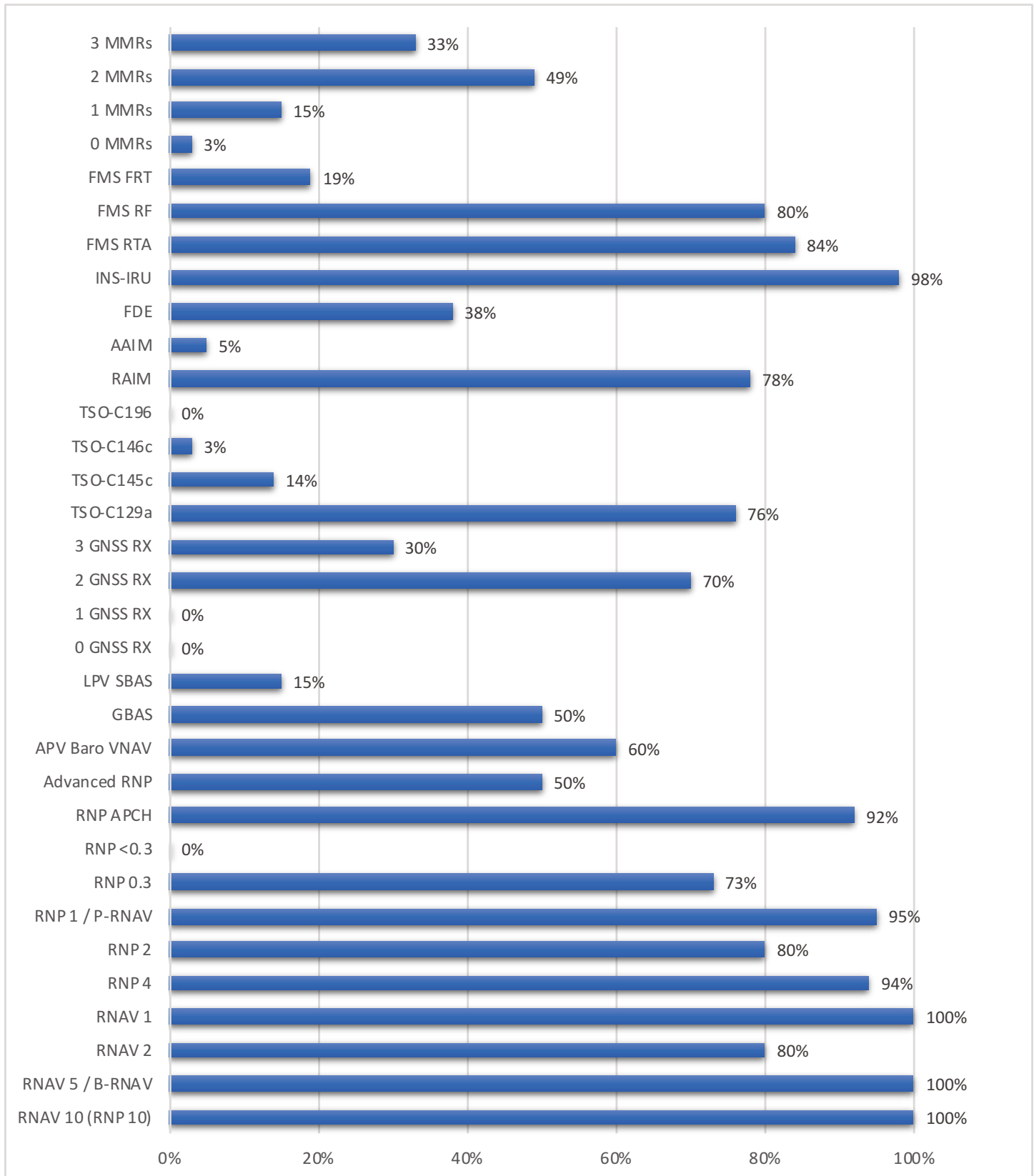


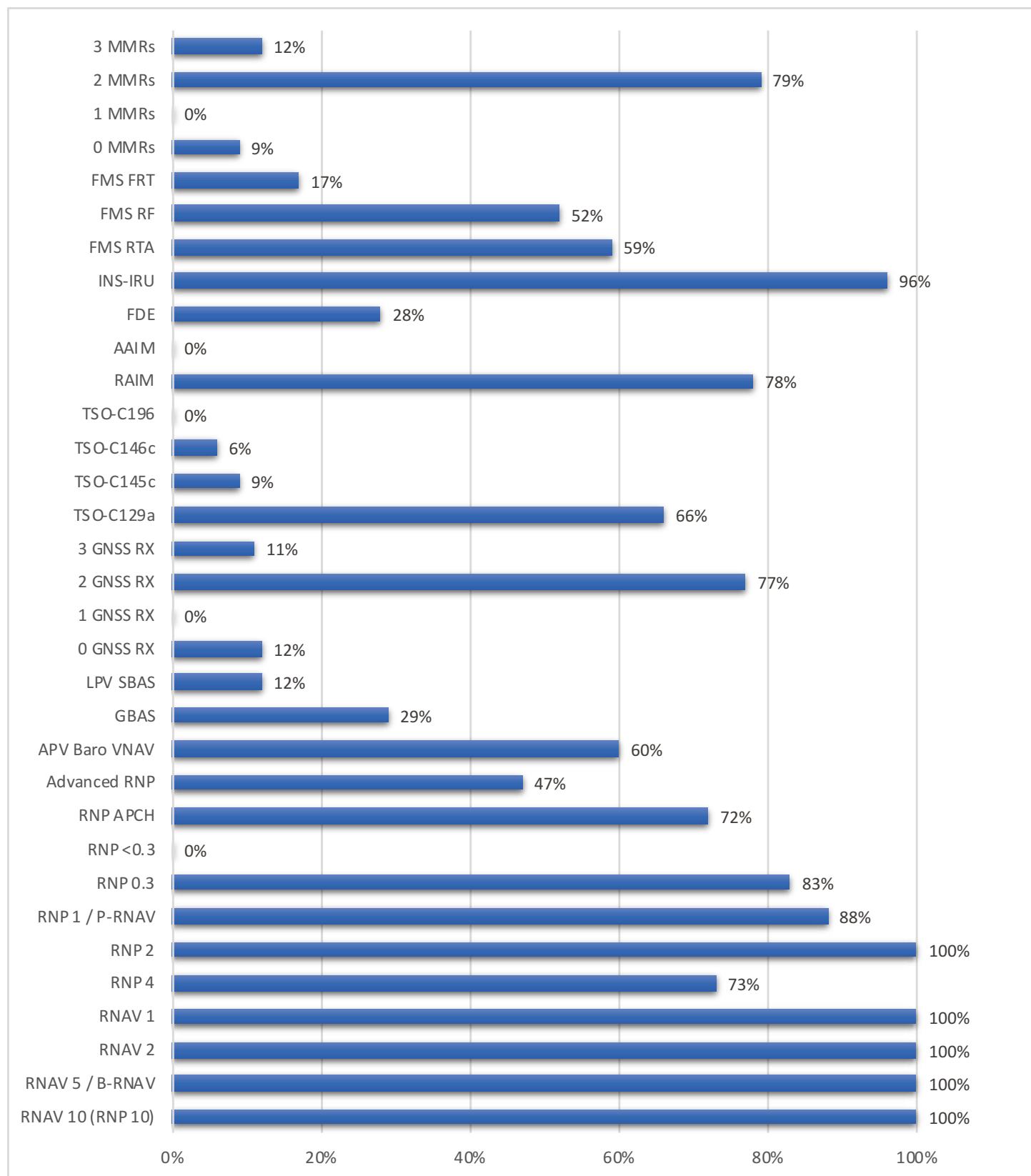
Shanwick Oceanic

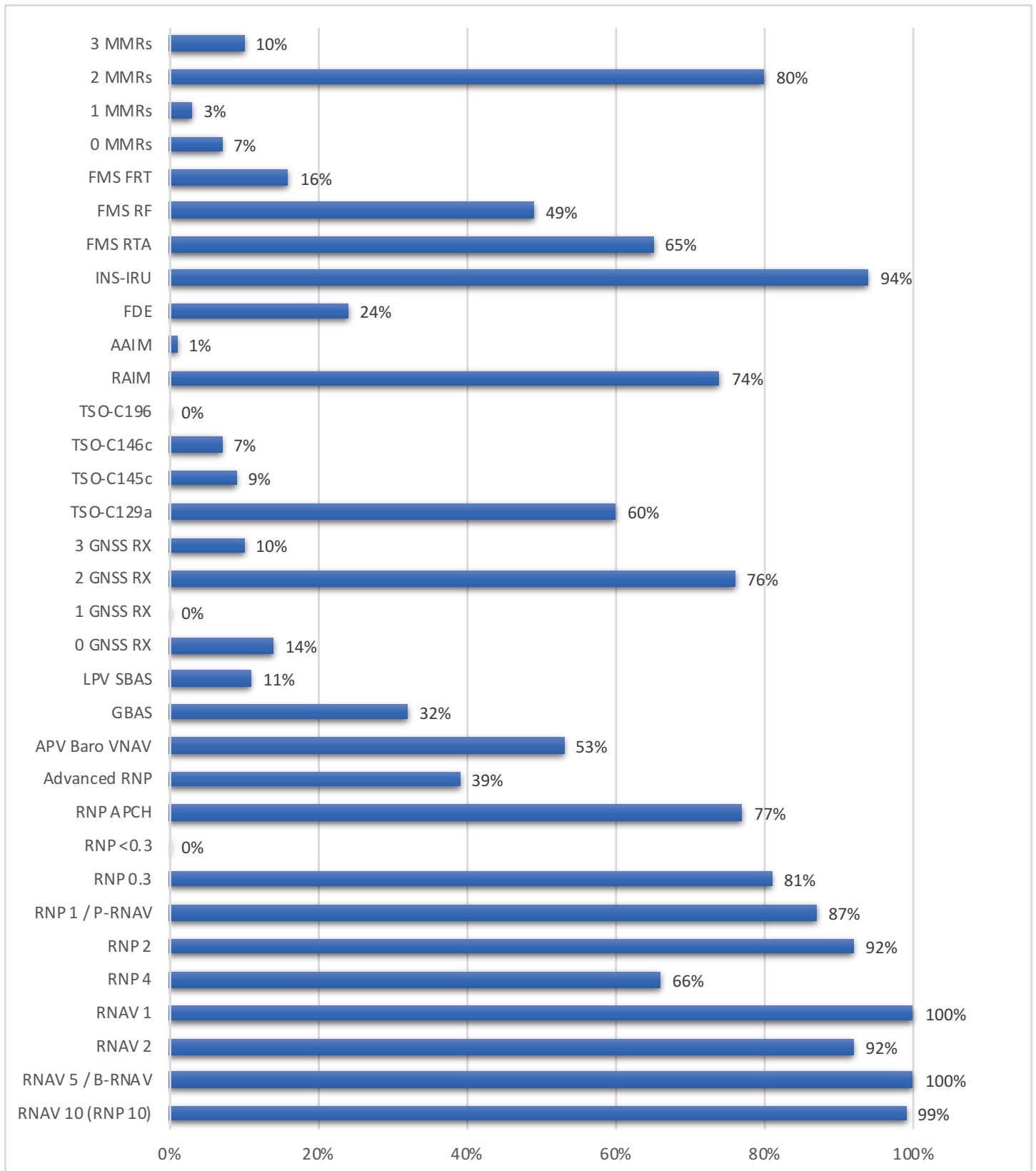


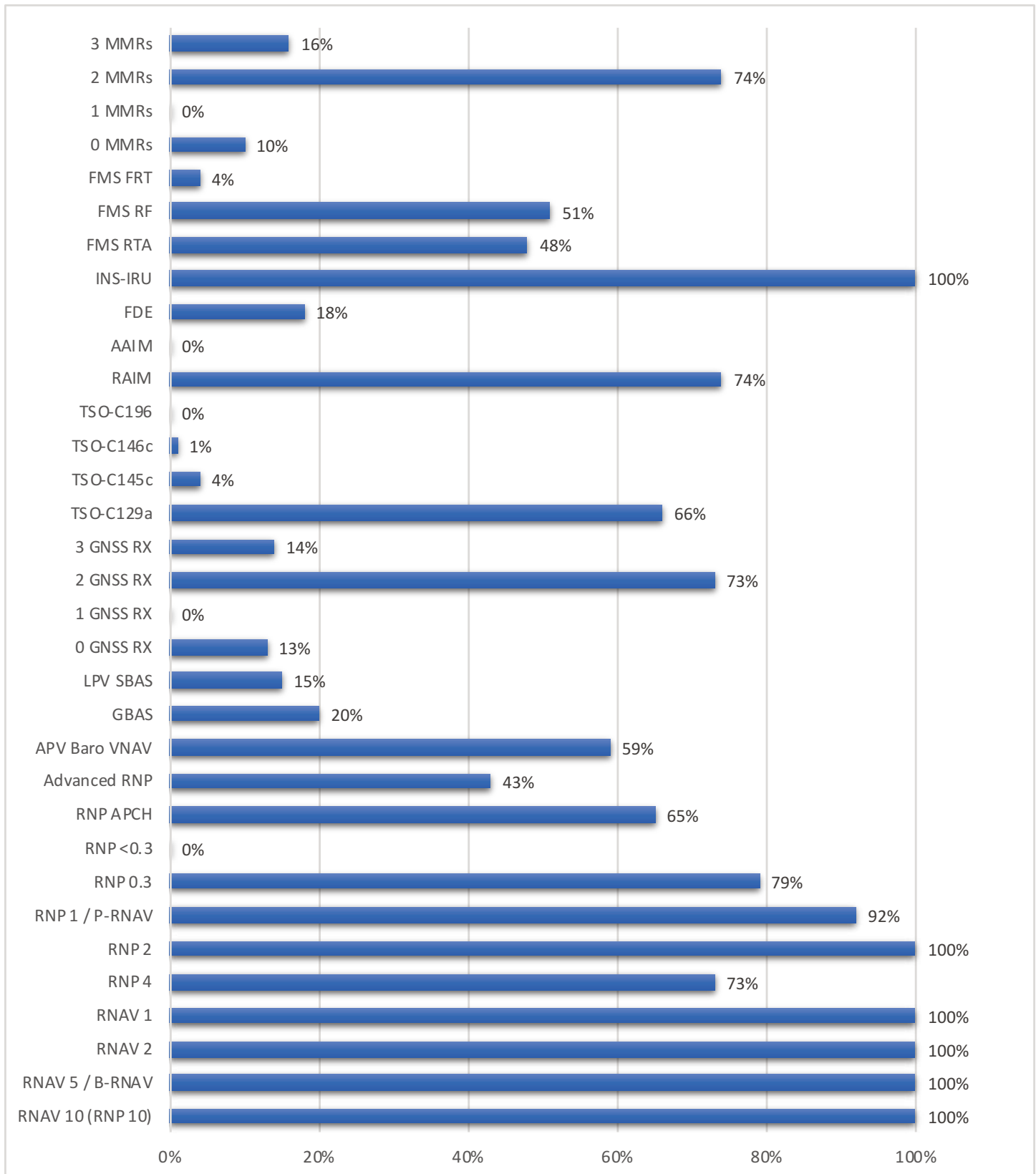


Trans-Polar (North and/or South)









Work In Progress

All Americas Region airspace users including airlines, business, military and general aviation are welcome to contribute to this series of equipage and capability reports.

The associated survey is located here...

Aircraft Equipage and Capability Survey



Based on a survey of 3,375 airframes

Categorized by Flight Information Region (FIR)



IATA Americas Region

SURVEILLANCE

Replacing assumptions with facts

This report is based on unedited airspace user submissions

Refer to statistical note on page 2

CONTRIBUTING AIRSPACE USERS

AEROMEXICO, AEROMEXICO CONNECT, AEROLITORAL, AIR CANADA, AIR CANADA ROUGE, AIR NEW ZEALAND, AIR EUROPA, AVIANCA BRAZIL, AZUL, CONDOR, COPA, DELTA, ETIHAD, FEDEX, GOL, IBERIA, JETBLUE, KLM, LATAM AIRLINES, LIAT, QATAR AIRWAYS, ROYAL JORDANIAN, SAS, SWISS, SWISS GLOBAL, UNITED, UPS.

AIRFRAME TYPES

A306, A310, A319, A320, A321, A330, A332, A333, A343, A346, A359, A388, ATR42, ATR72, B737, B738, B739, B744, B757, B752, B763, B767, B772, B777, B77F, B77L, B77W, B787, B788, B789, DC10, E170, E190, MD11, MD88, MD90.

DISCLAIMER: The information contained in this document is subject to constant review and update in light of continuing airspace user contributions via an on-line airframe equipage and capability survey and/or other sources. No reader should act on the basis of any such information without referring to applicable laws and regulations and/or without taking appropriate professional advice. Although every effort has been made to ensure accuracy, the International Air Transport Association shall not be held responsible for any loss or damage caused by errors, omissions, misprints or misinterpretation of the contents hereof. Furthermore, the International Air Transport Association expressly disclaims any and all liability to any person or entity in respect of anything done or omitted, and the consequences of anything done or omitted by any such person or entity, in reliance on the contents of this publication.



Data compilation date: 1st October 2018

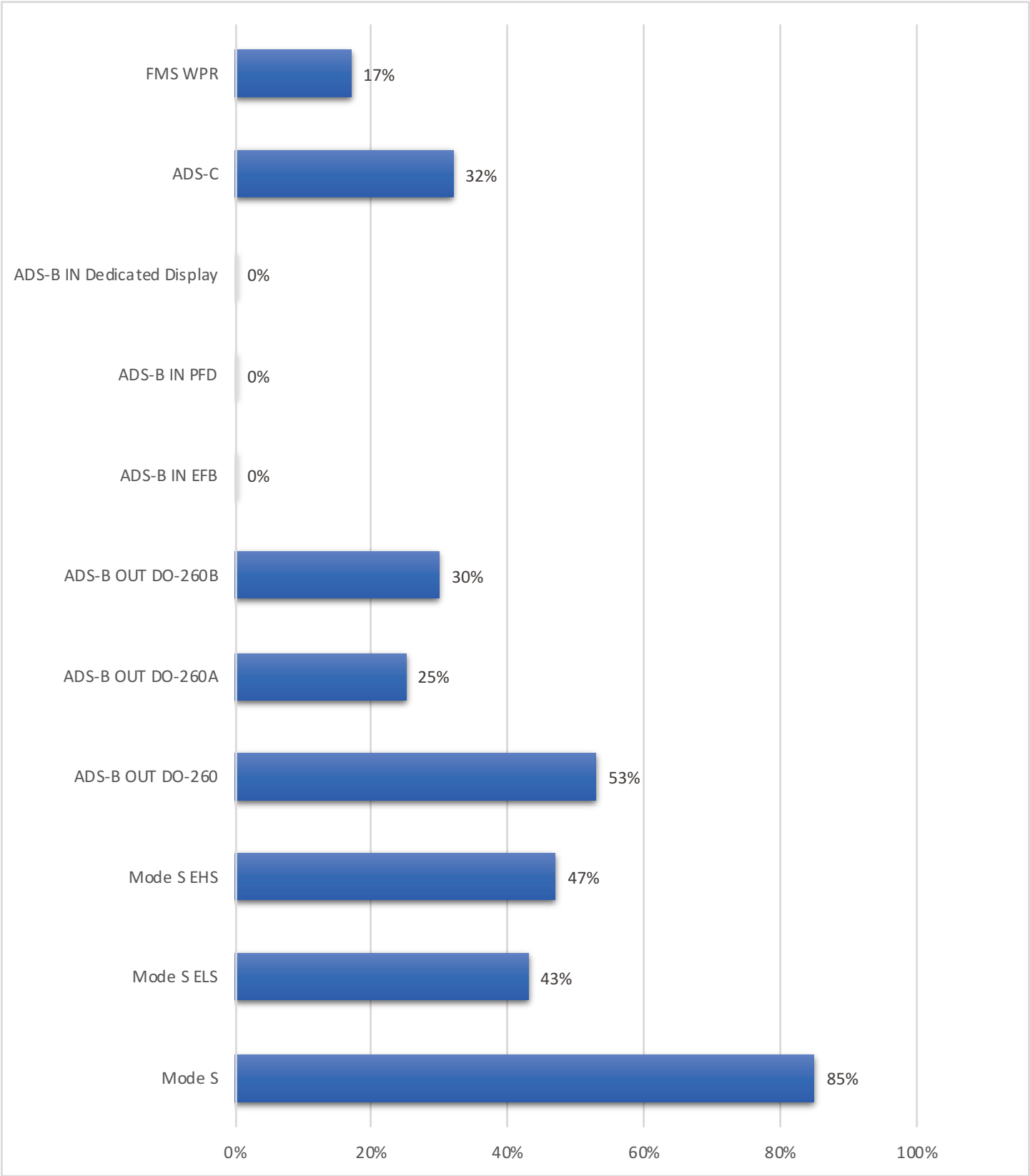
Statistical Note

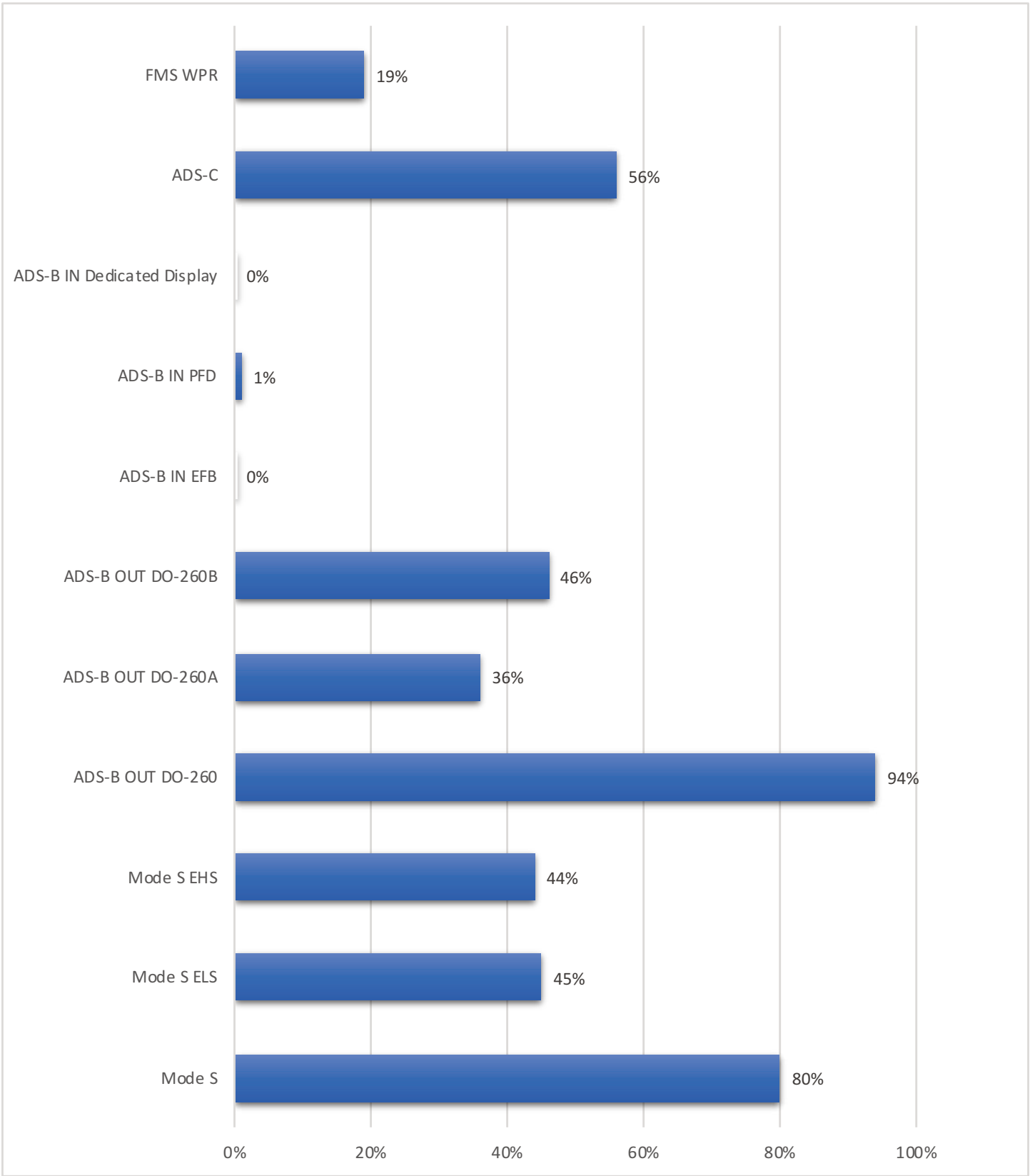
For certain parameters, e.g. ADS-B OUT, some airspace users selected the best capability of the fleet in question (DO-260B) but also selected lesser capabilities for the same fleet (DO-260A and DO-260). This leads to the same fleet being counted in each DO-260 category. Since DO-260B compliance betters the other selections, the ADS-B OUT operational capability of the subject fleet(s) was unedited for this report. A similar reporting phenomenon was observed with respect to Mode S transponders, sub-categories ELS, EHS. Further, in the case of capabilities that totaled as a fraction per FIR, e.g. "ADS-B IN displayed on PFD", these are reported as 1%.

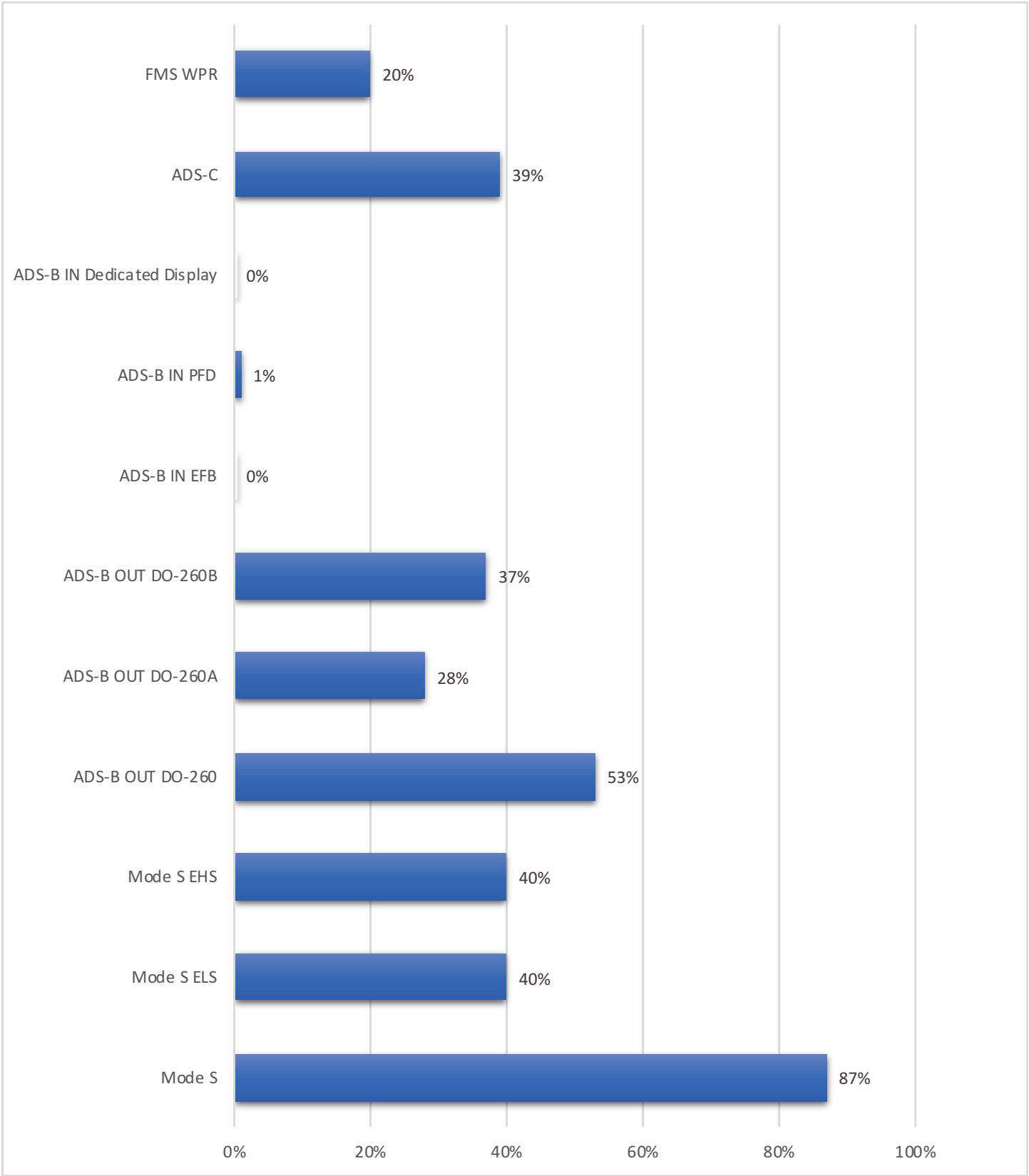
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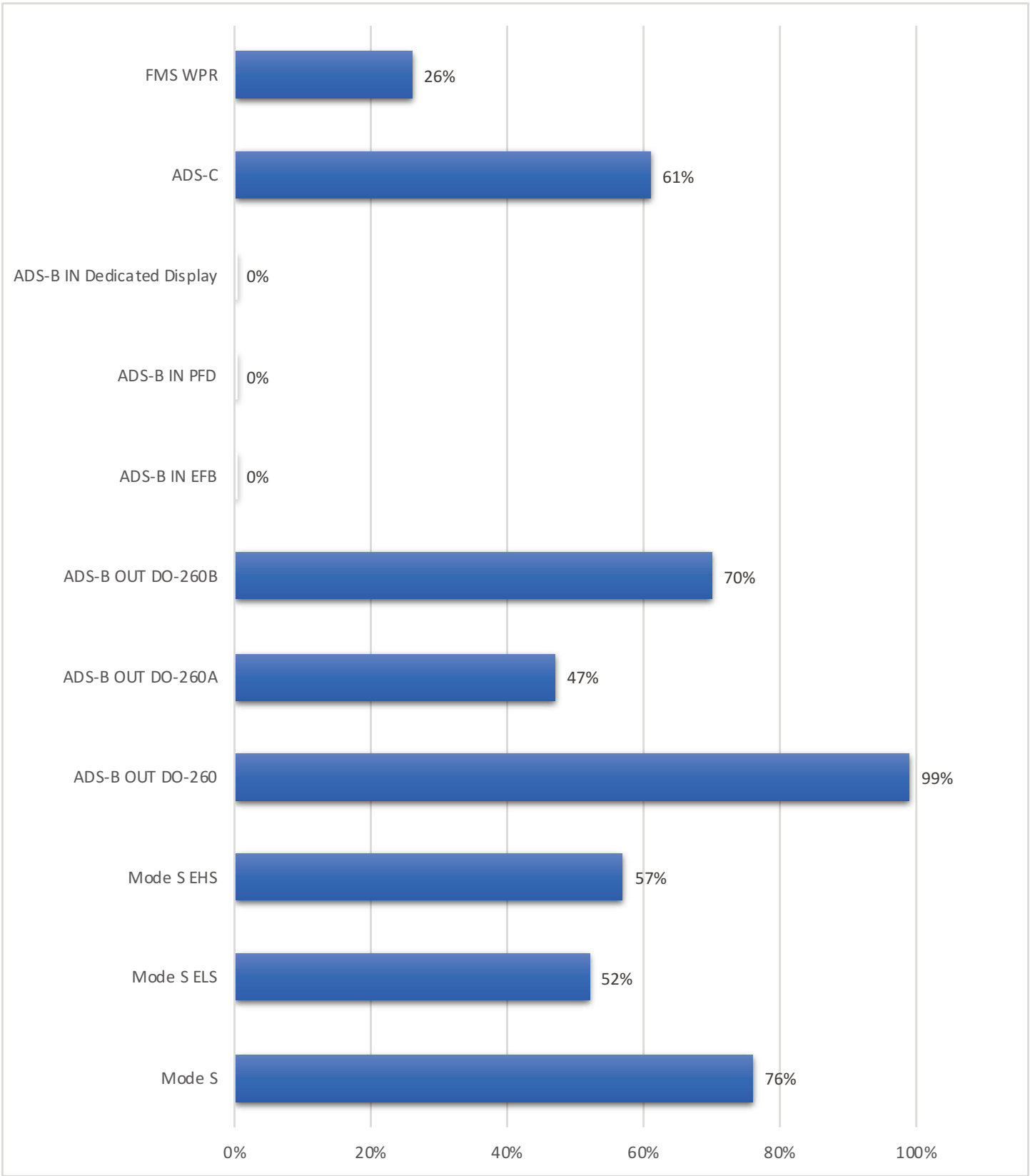
Mr. Kieran O'Carroll
Safety and Flight Operations Department
IATA Americas Region
703 Waterford Way, Suite 600
Miami, Florida 33126
USA

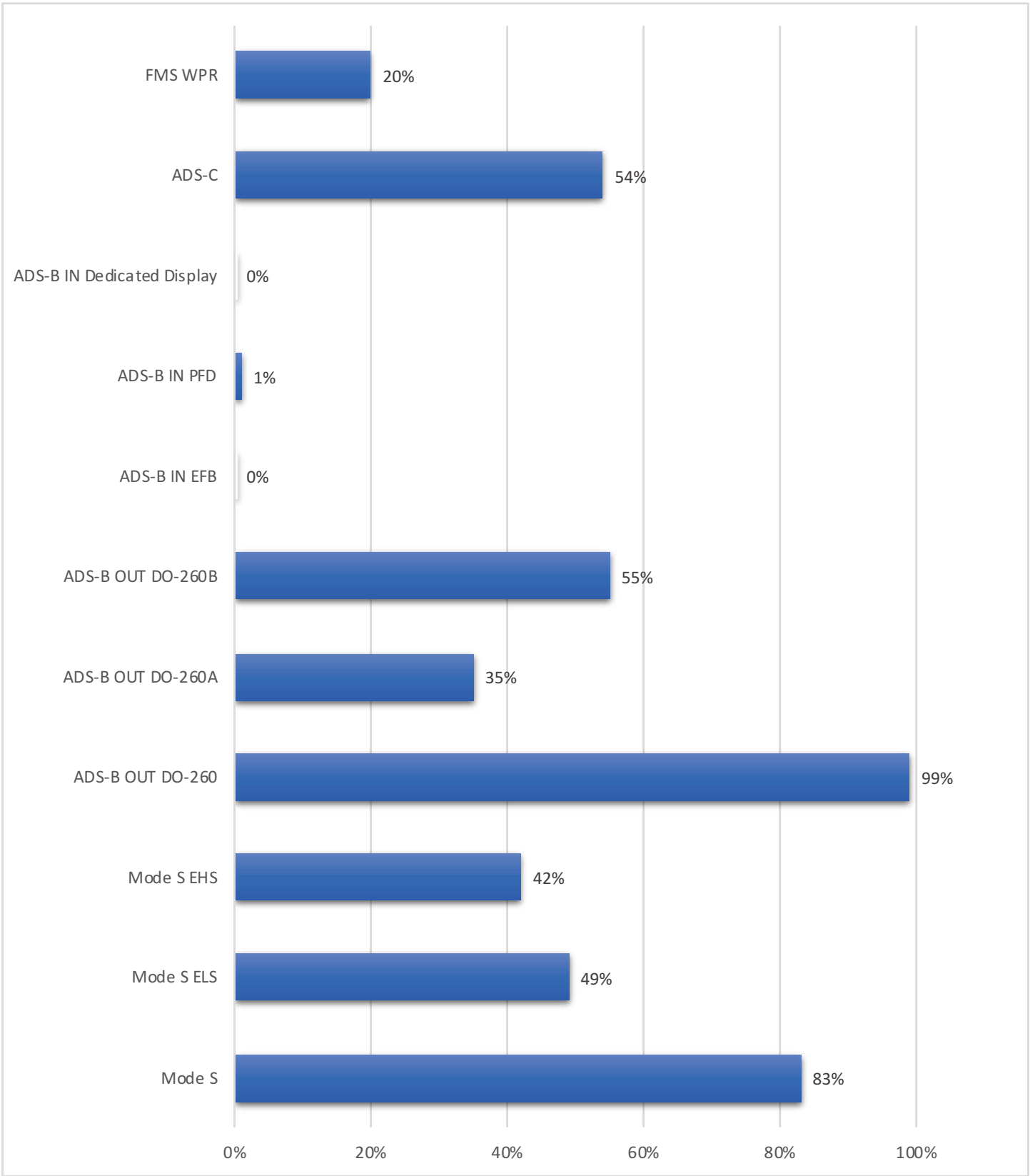
ocarrollk@iata.org

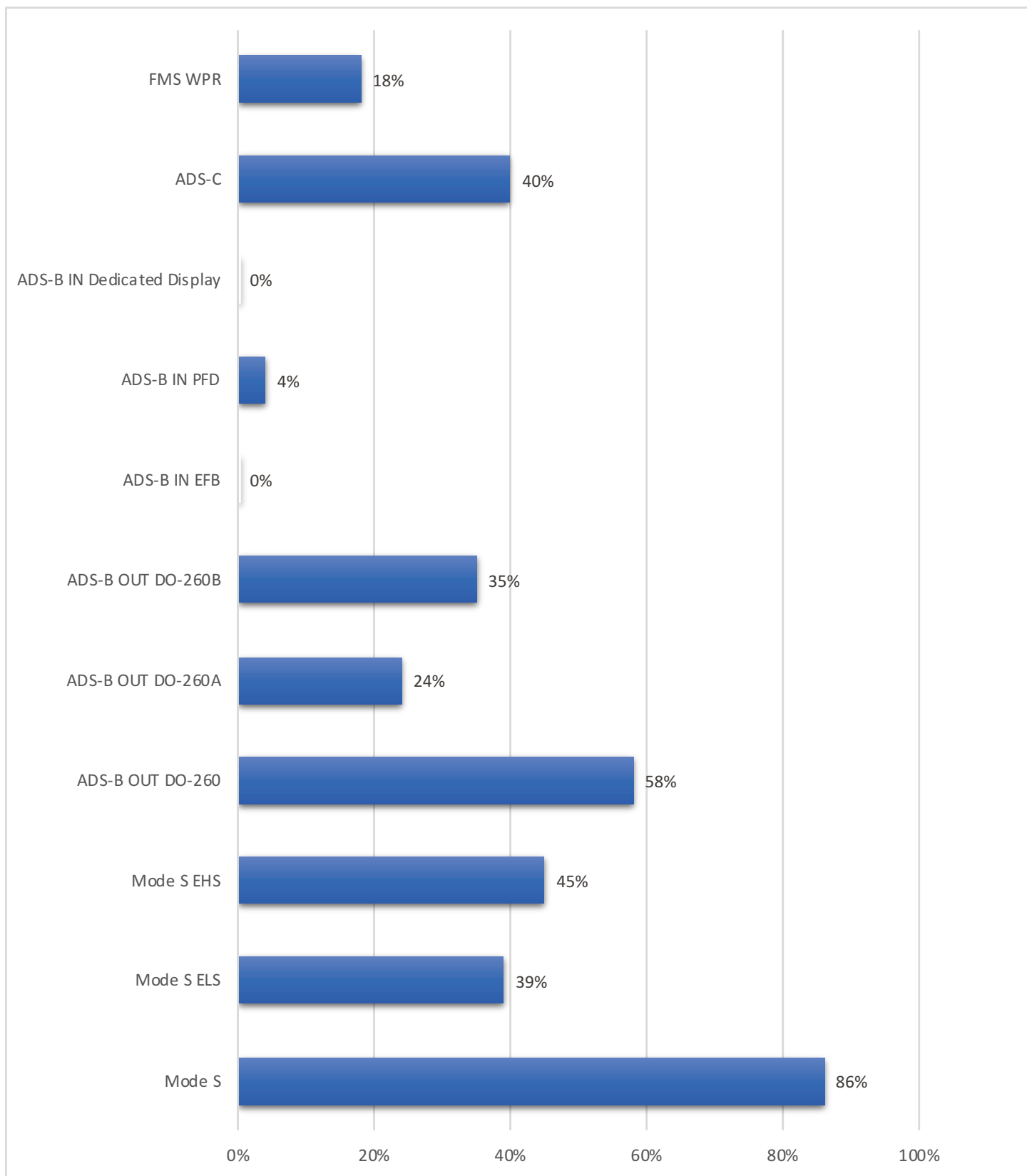


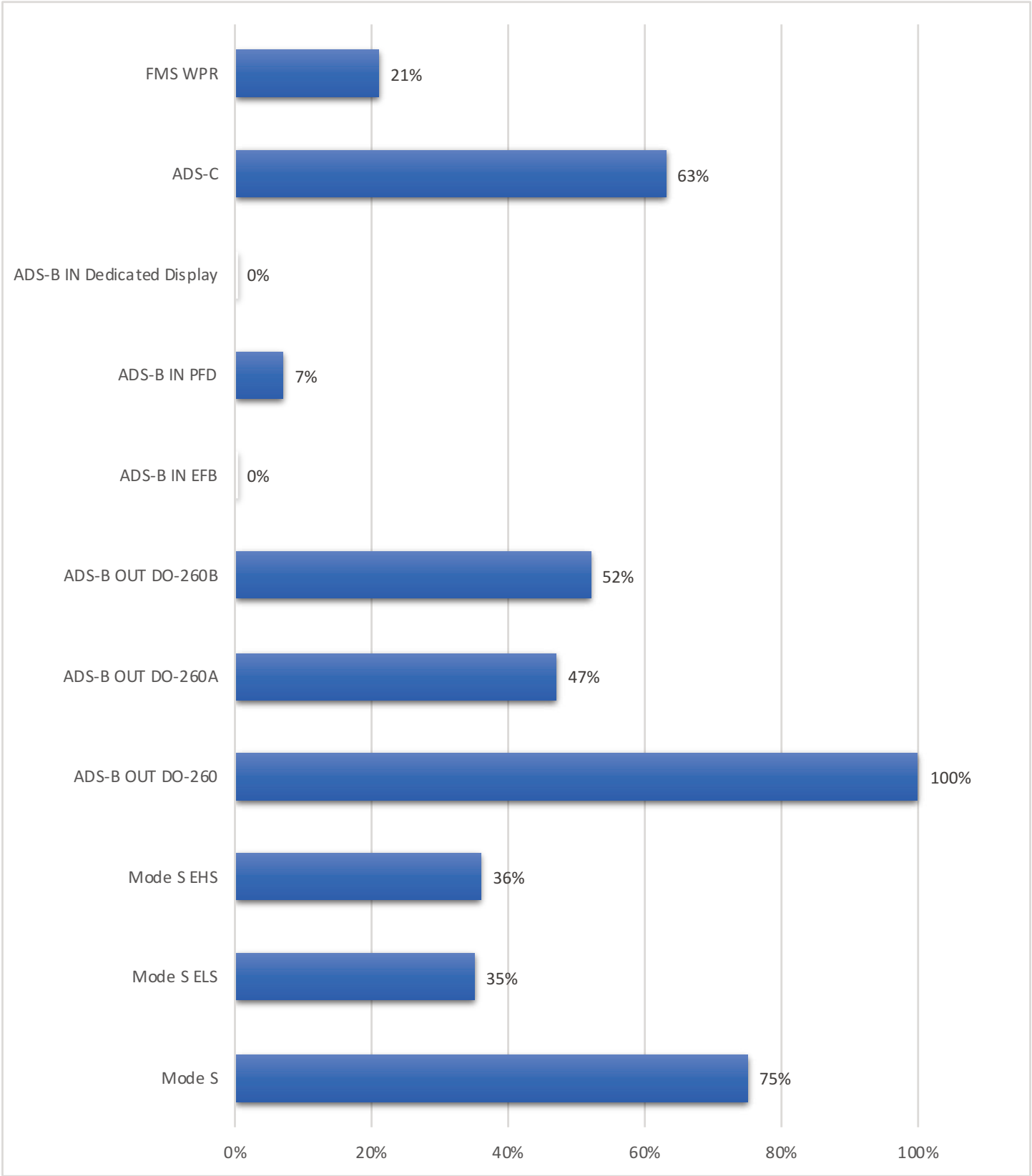


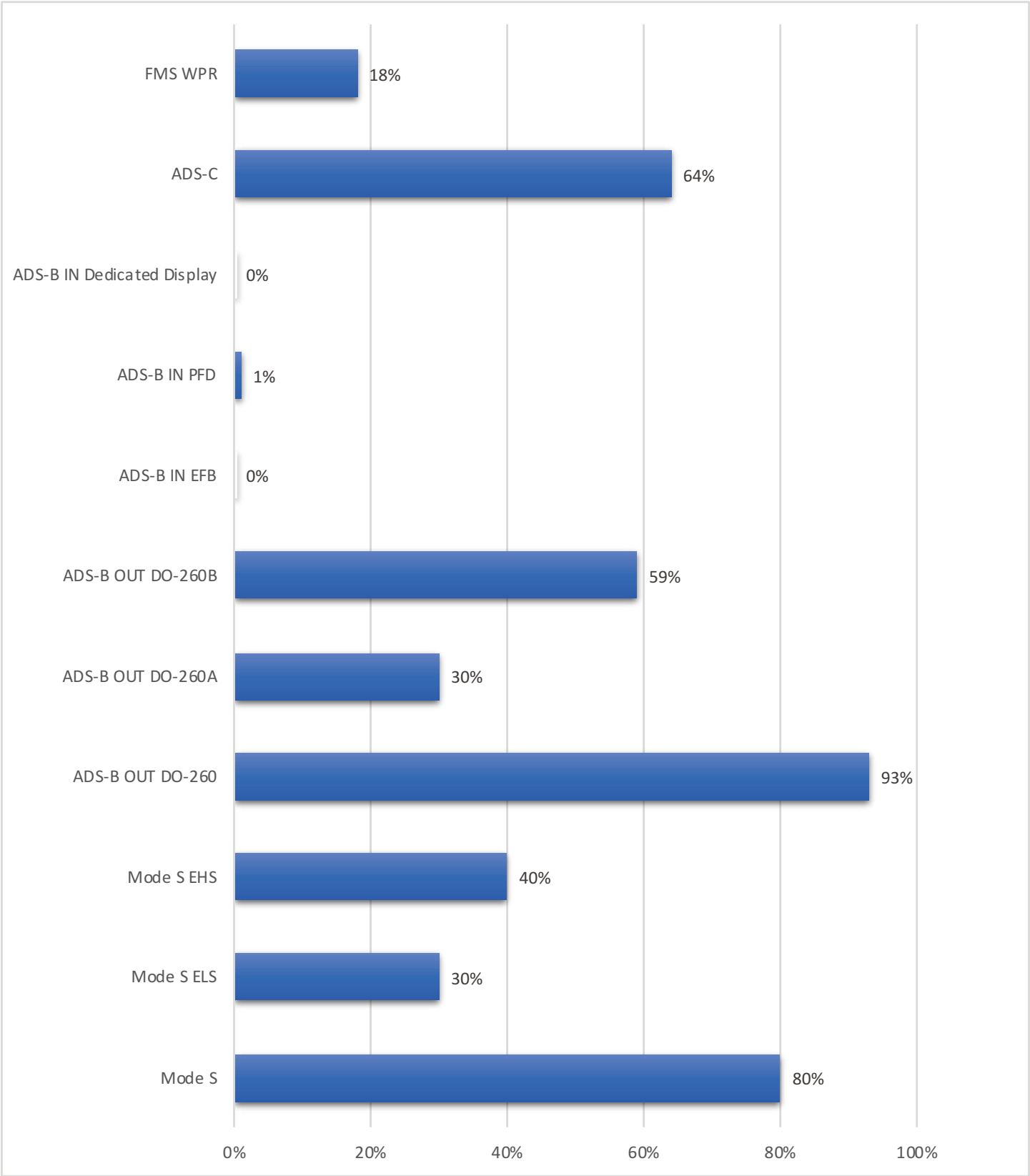


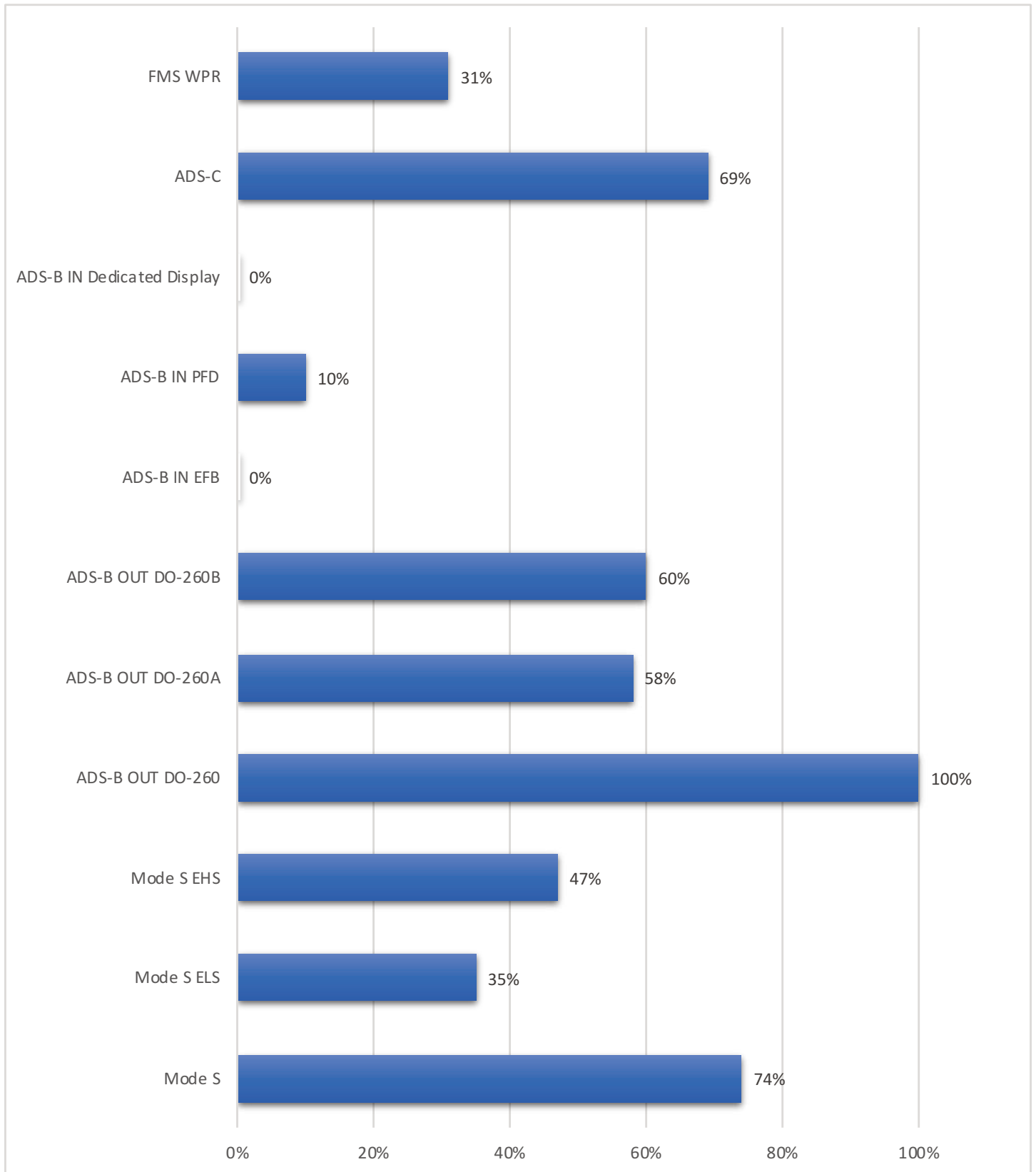


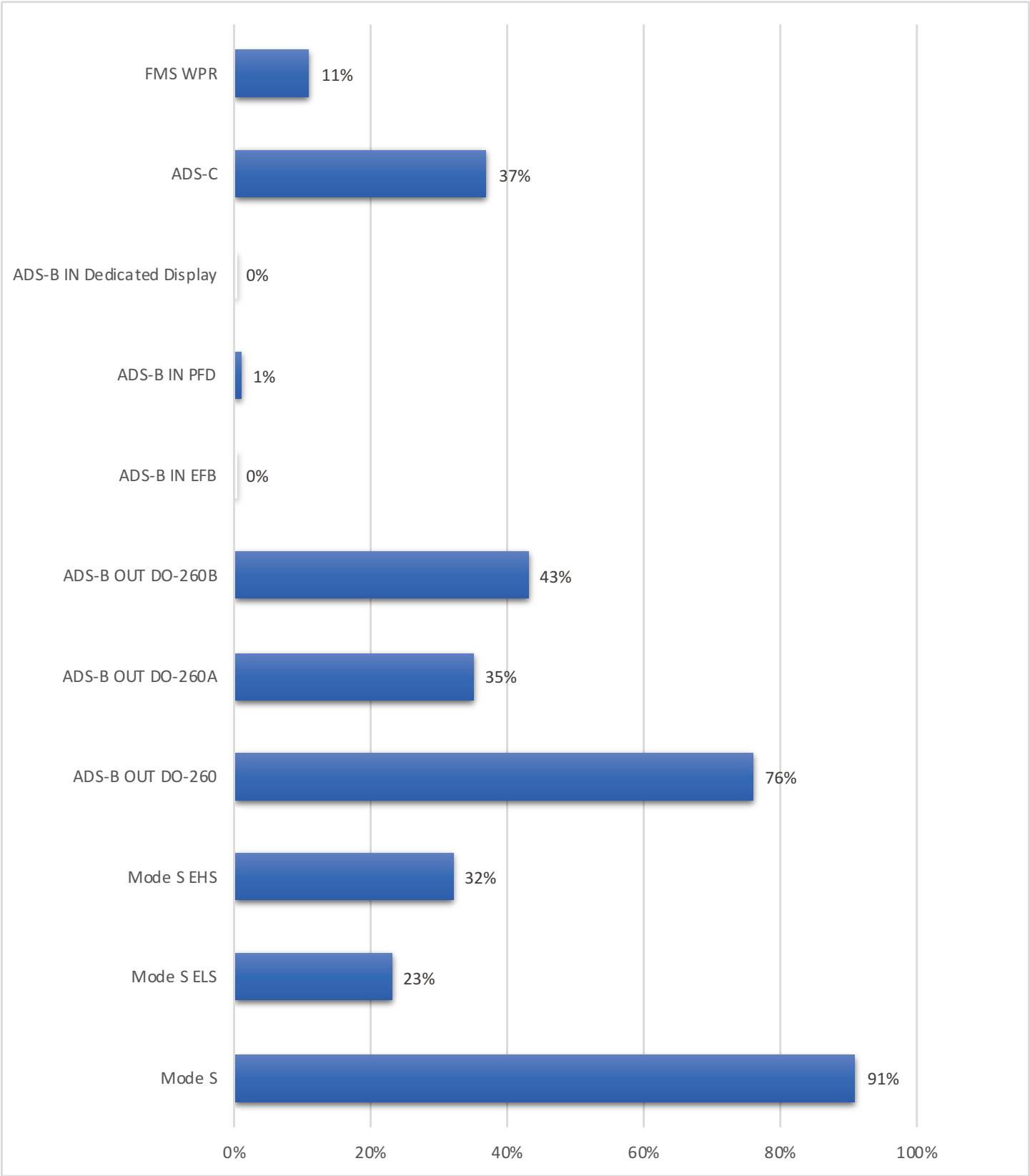


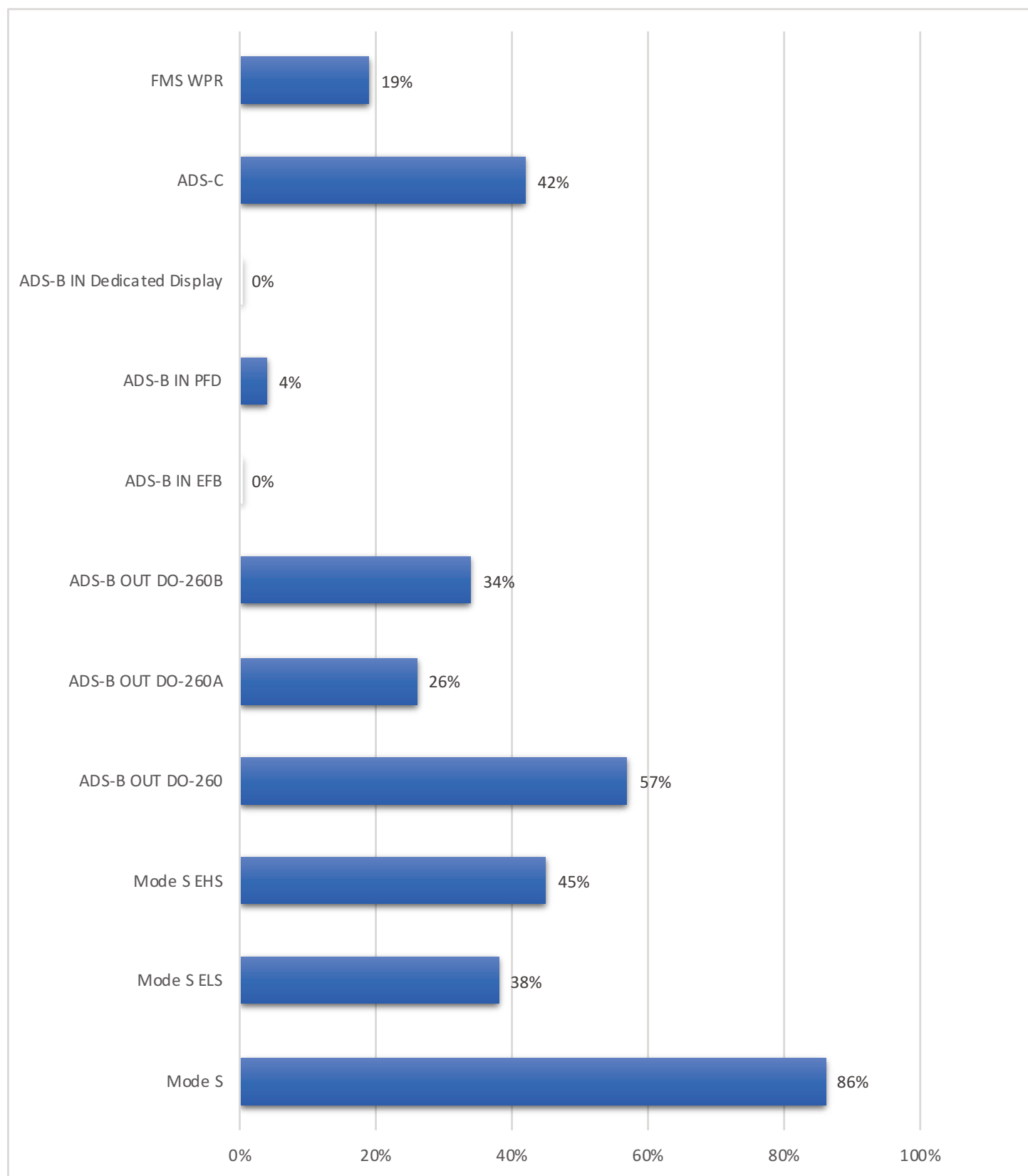


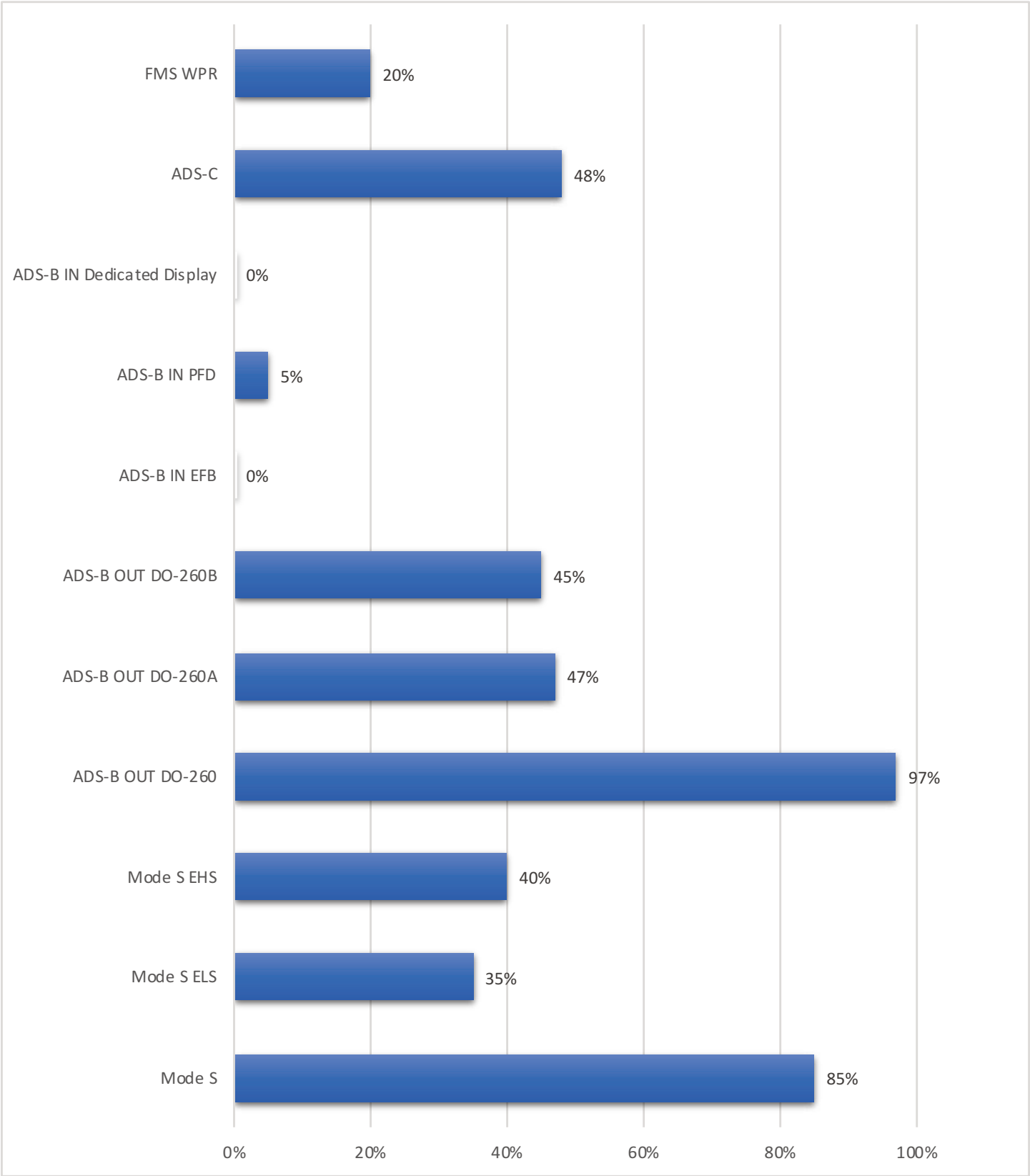


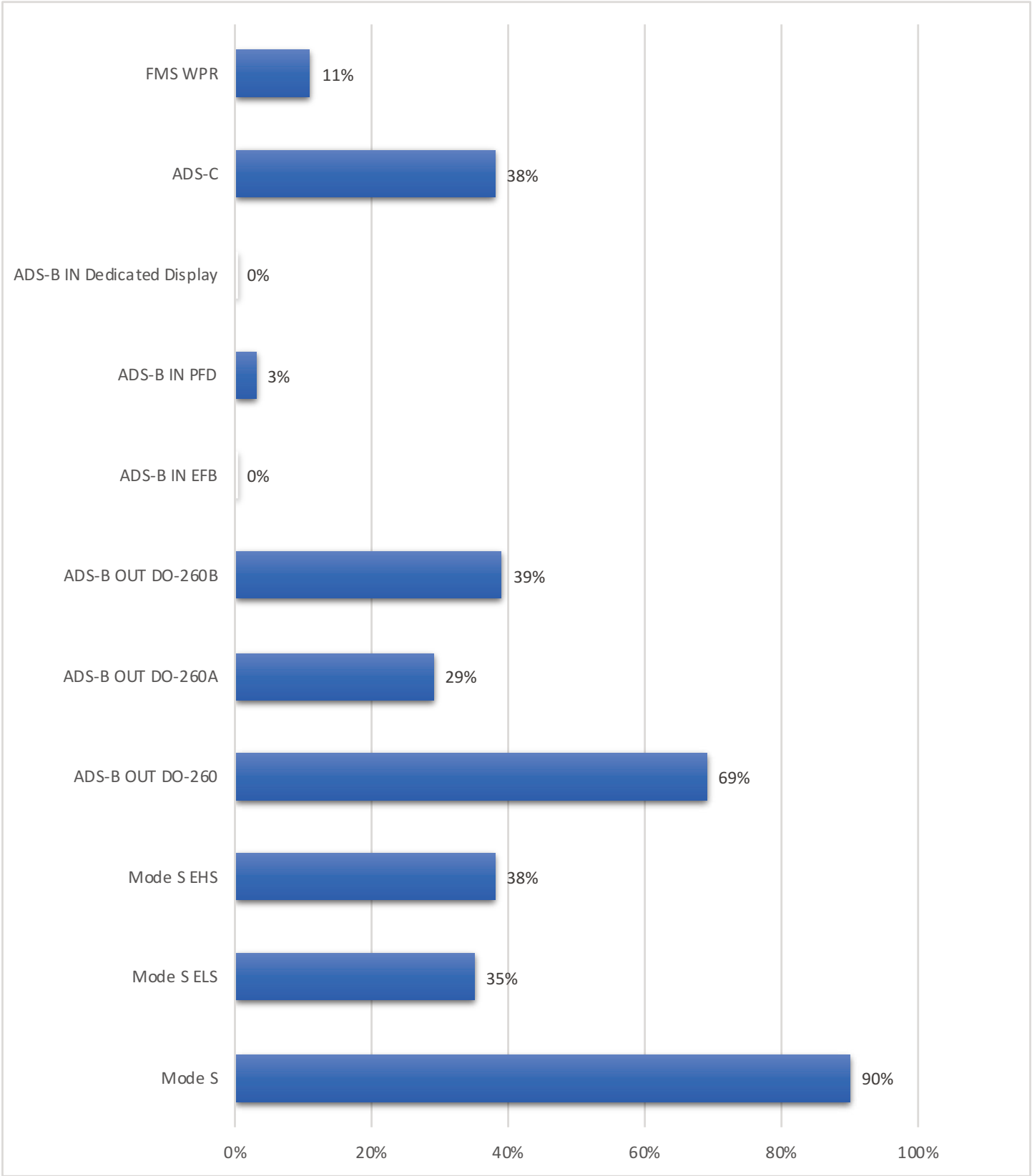


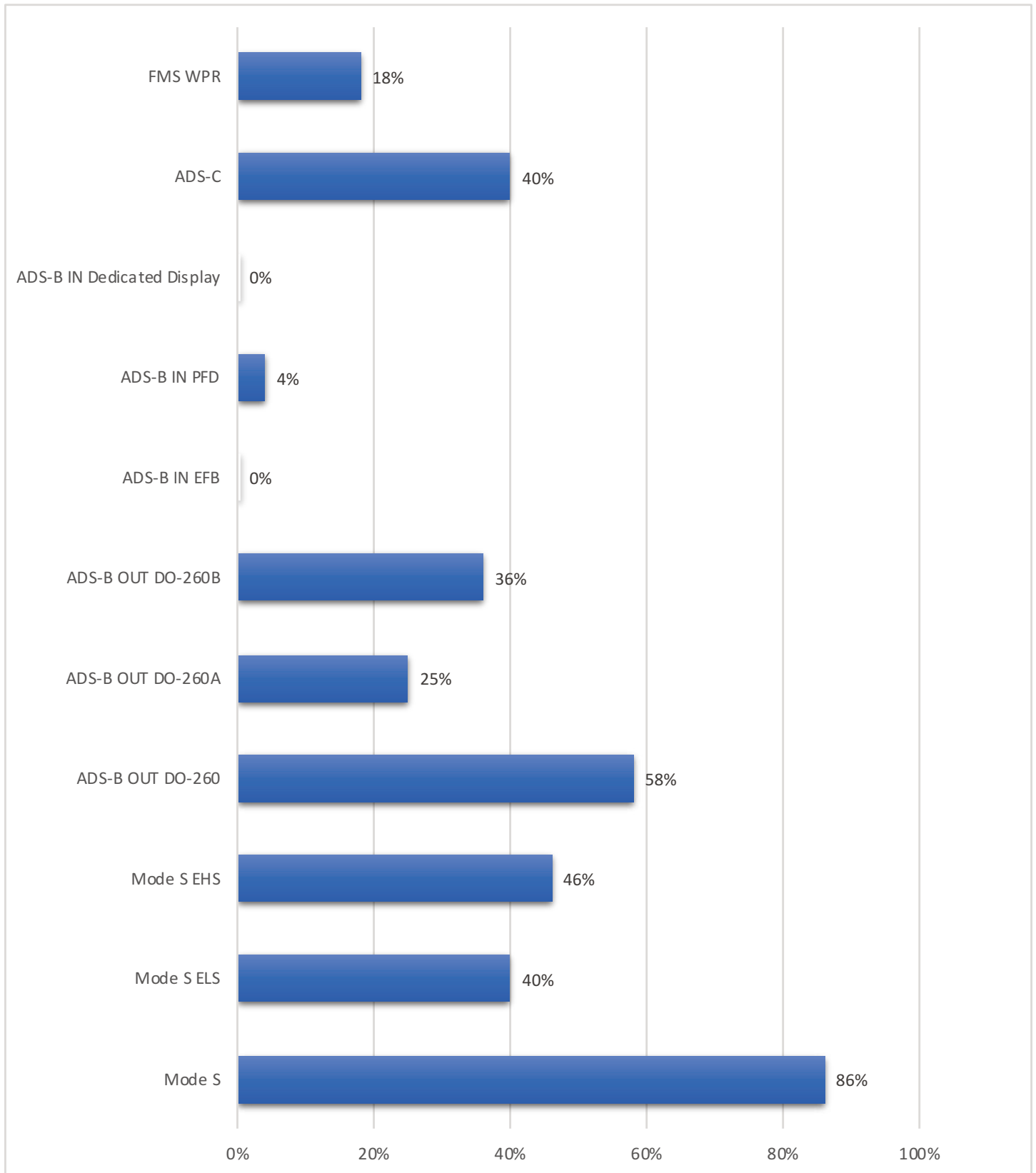


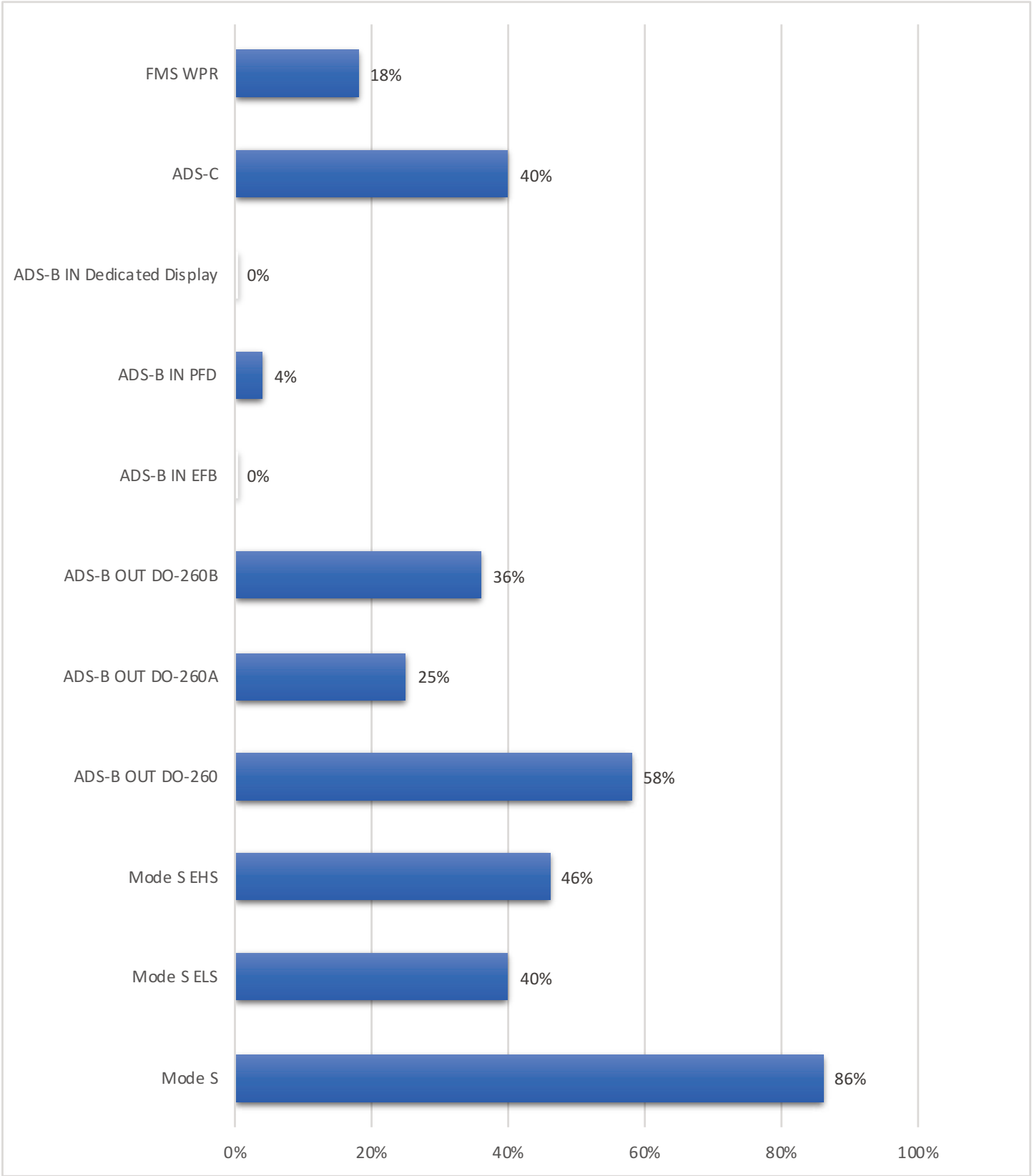


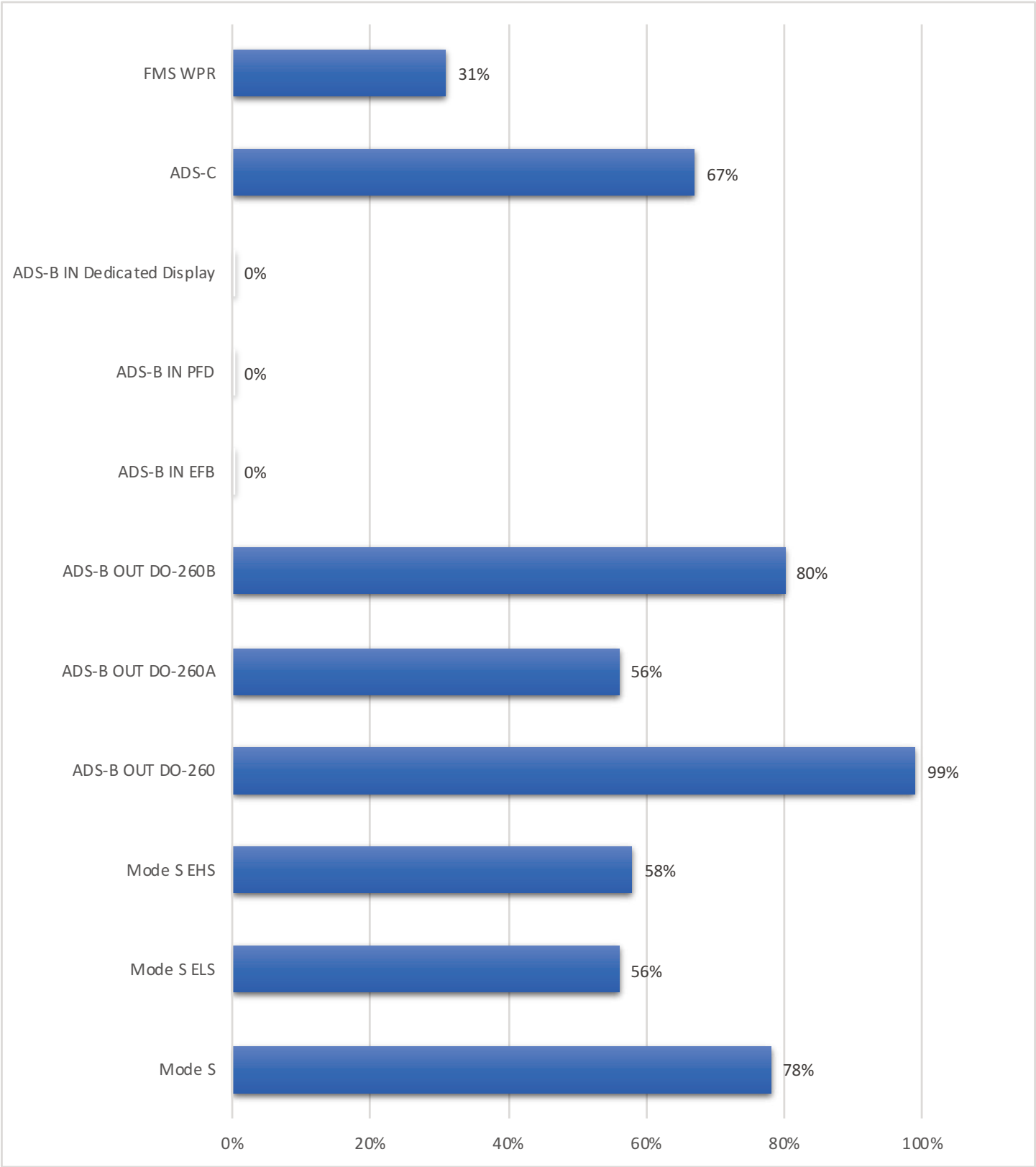


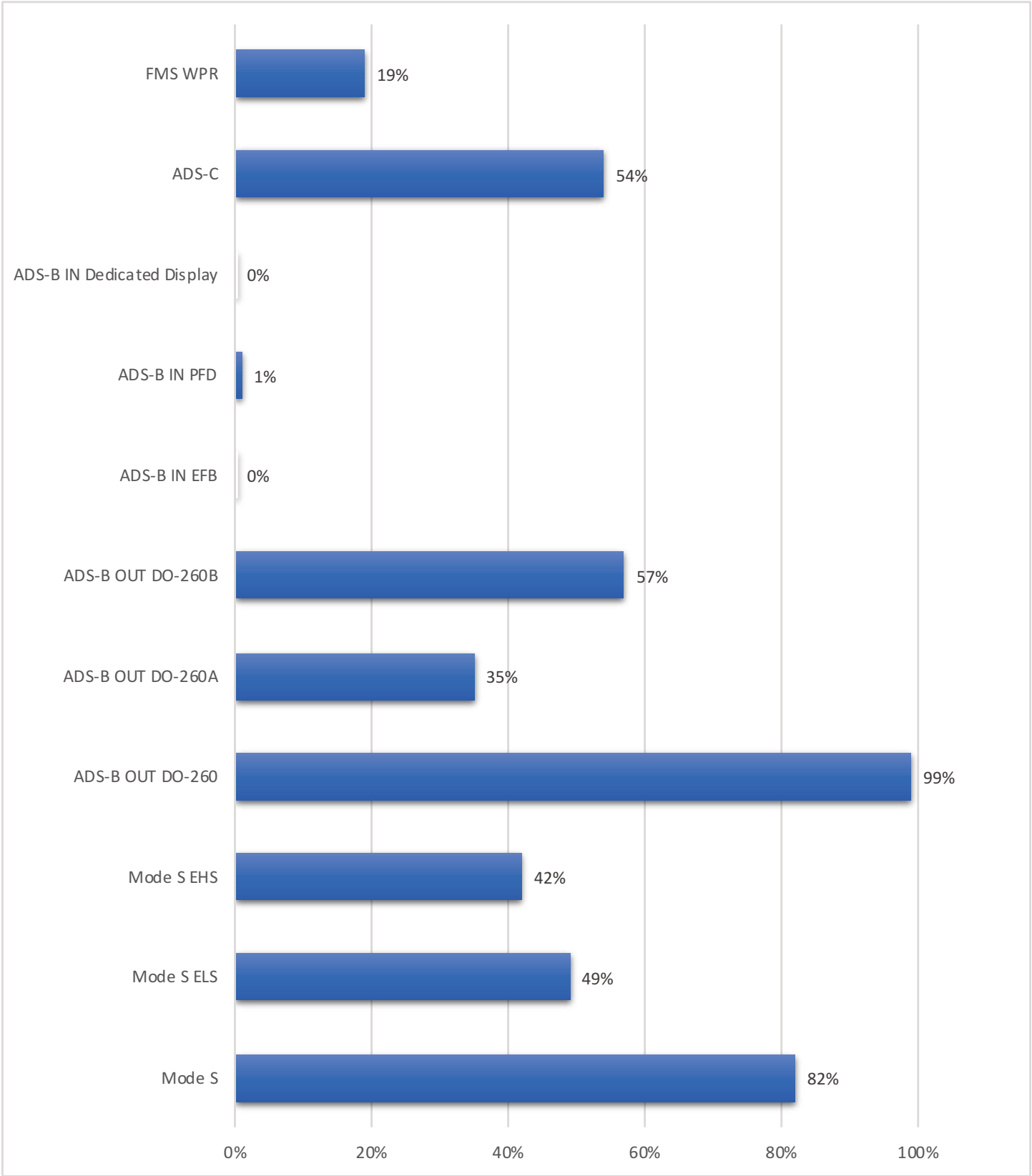


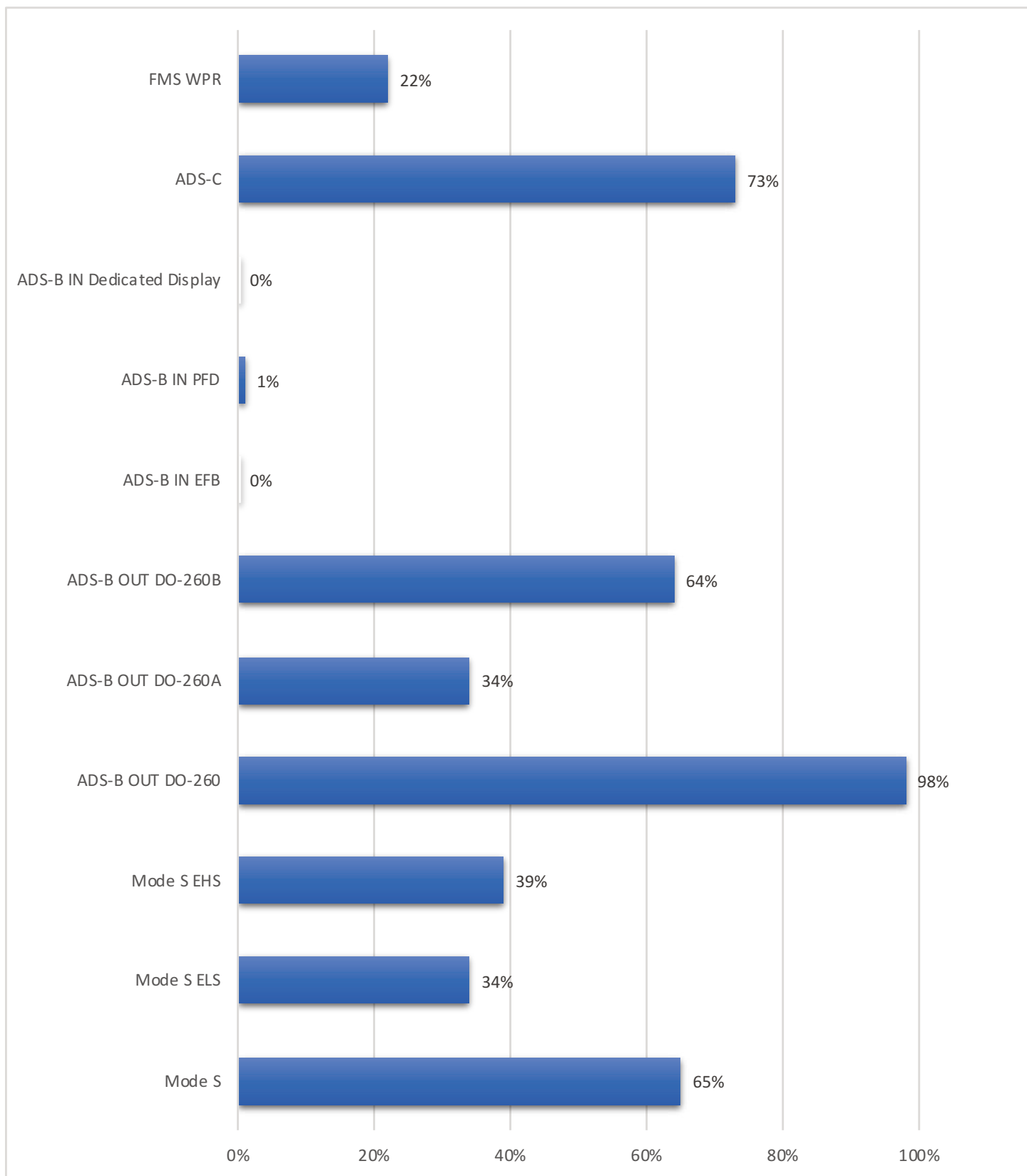


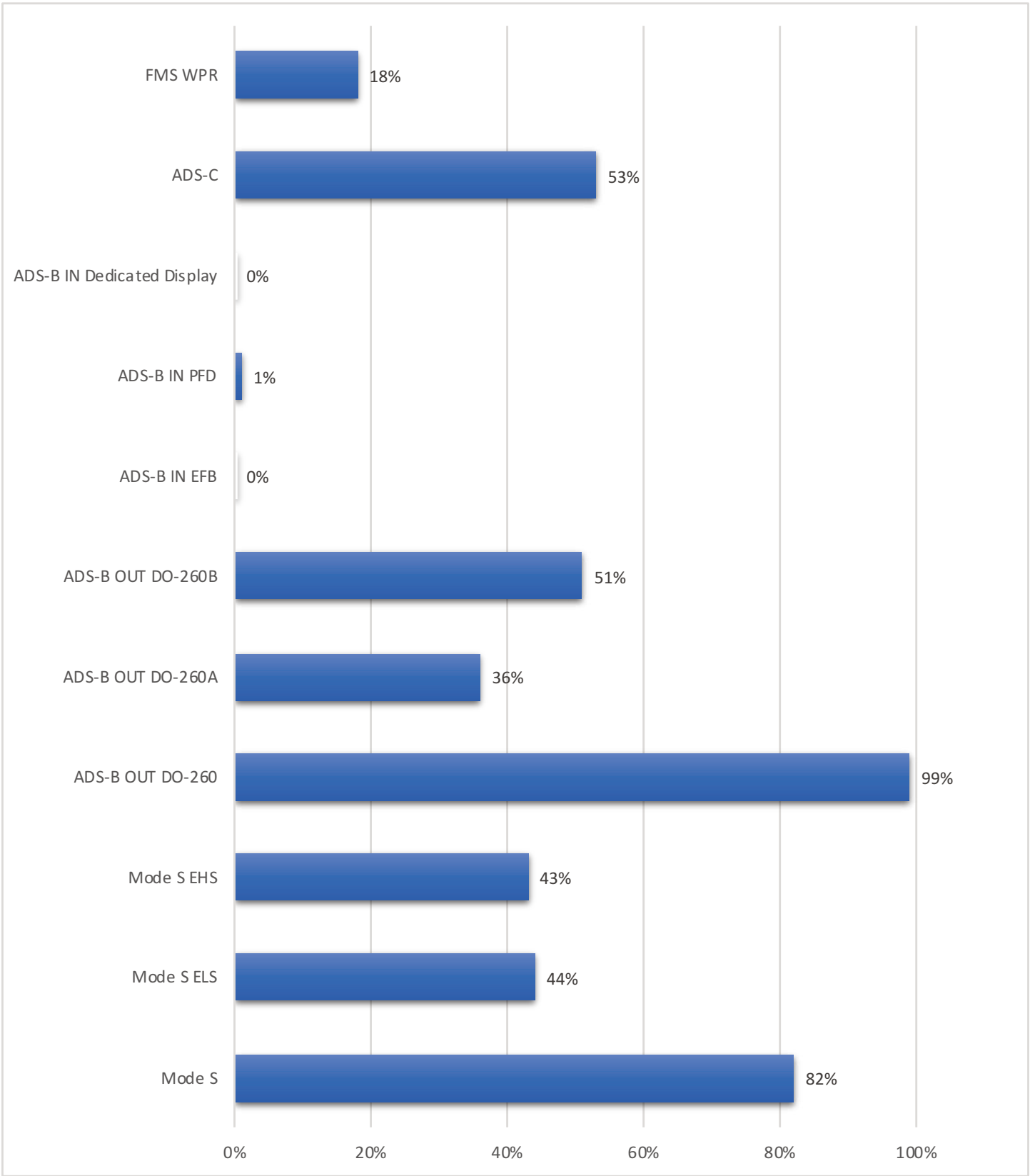


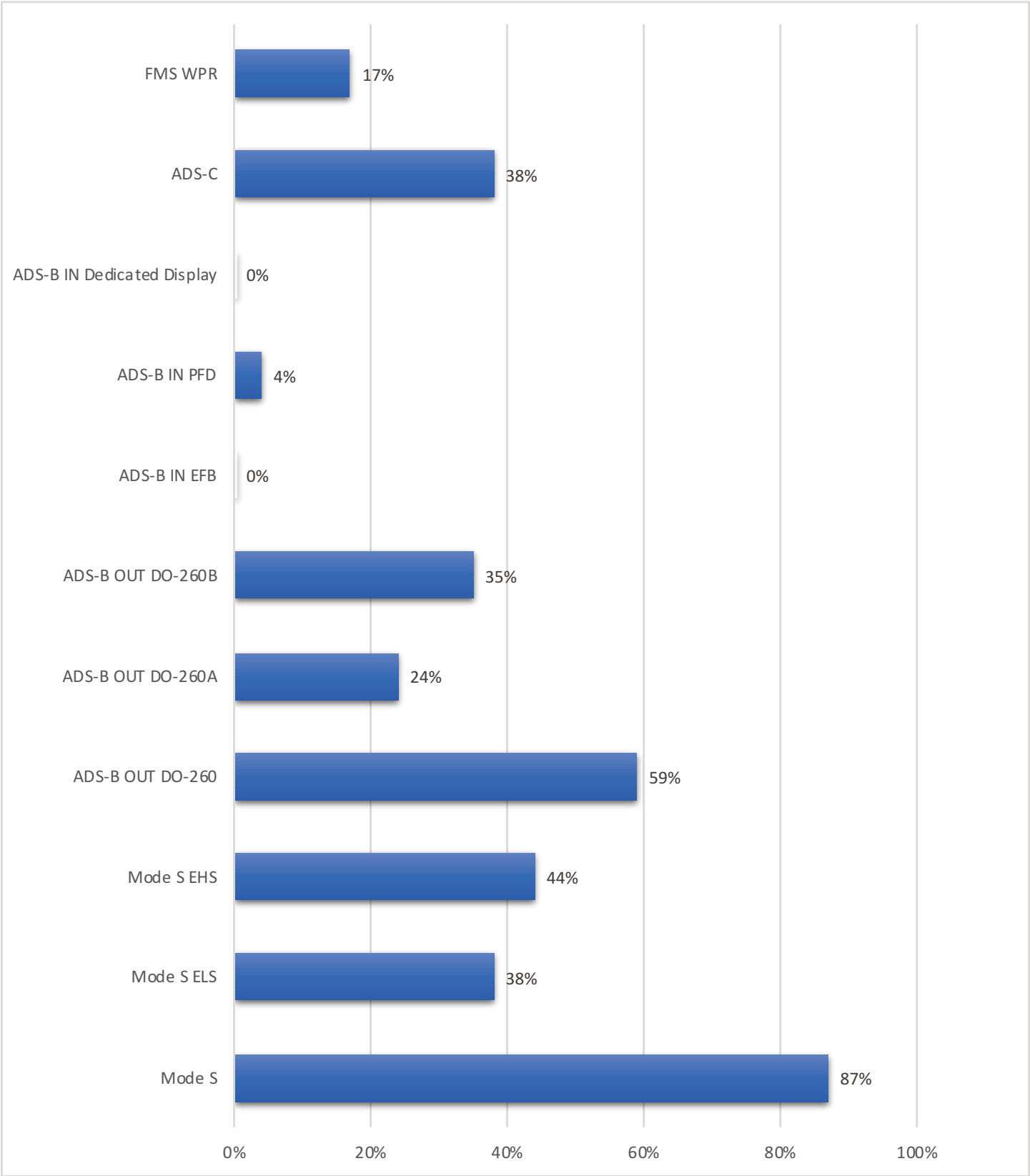


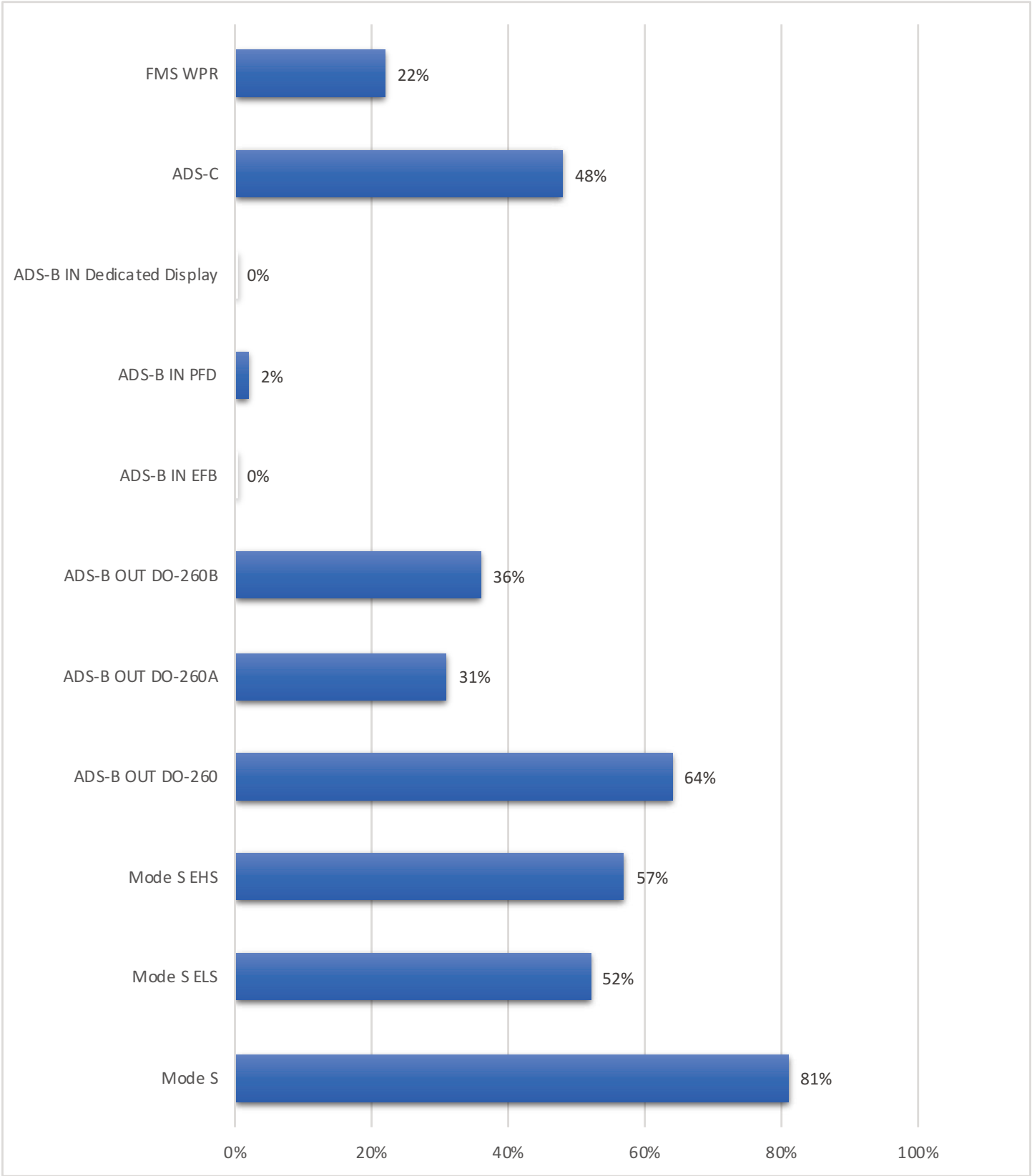


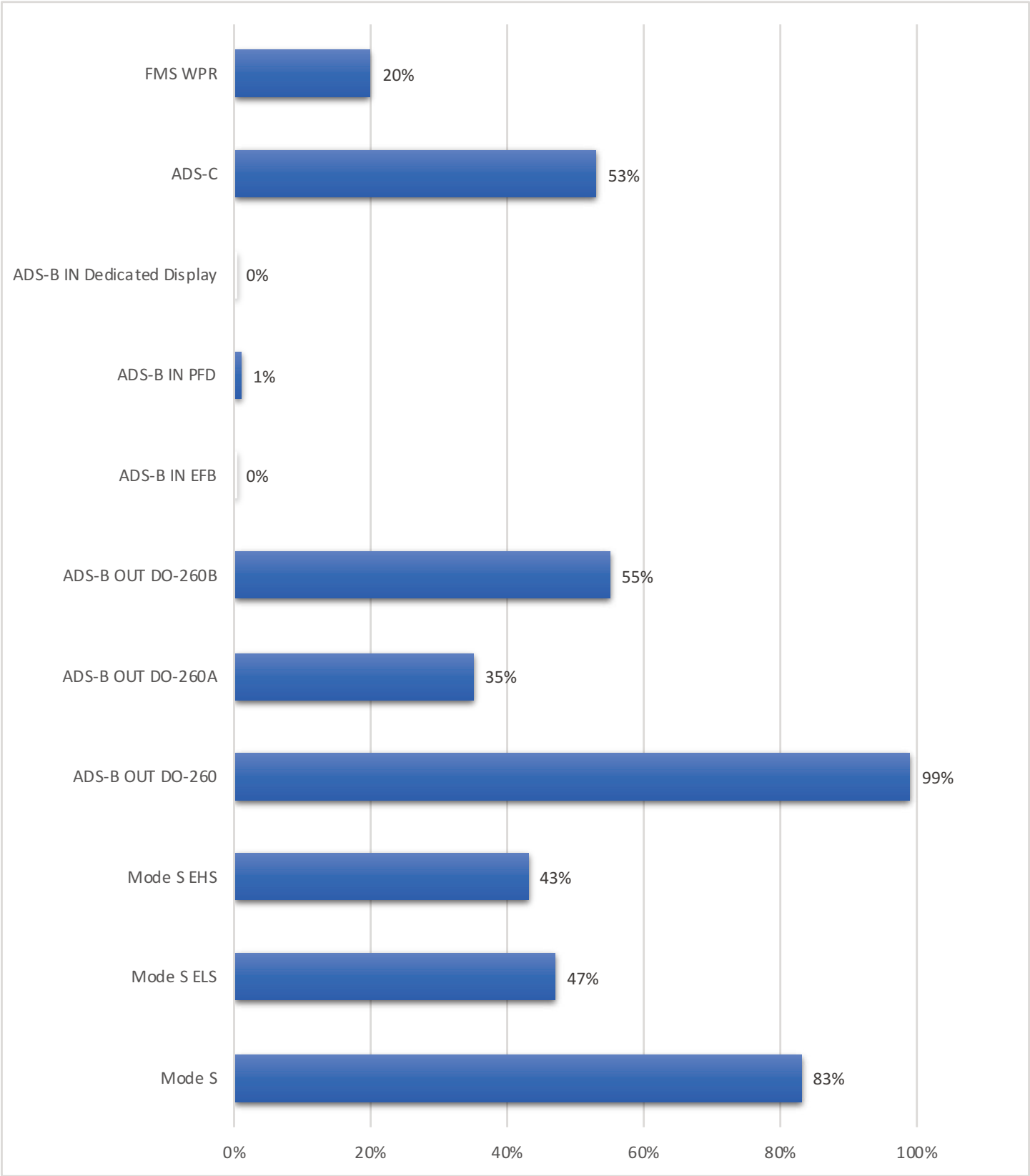




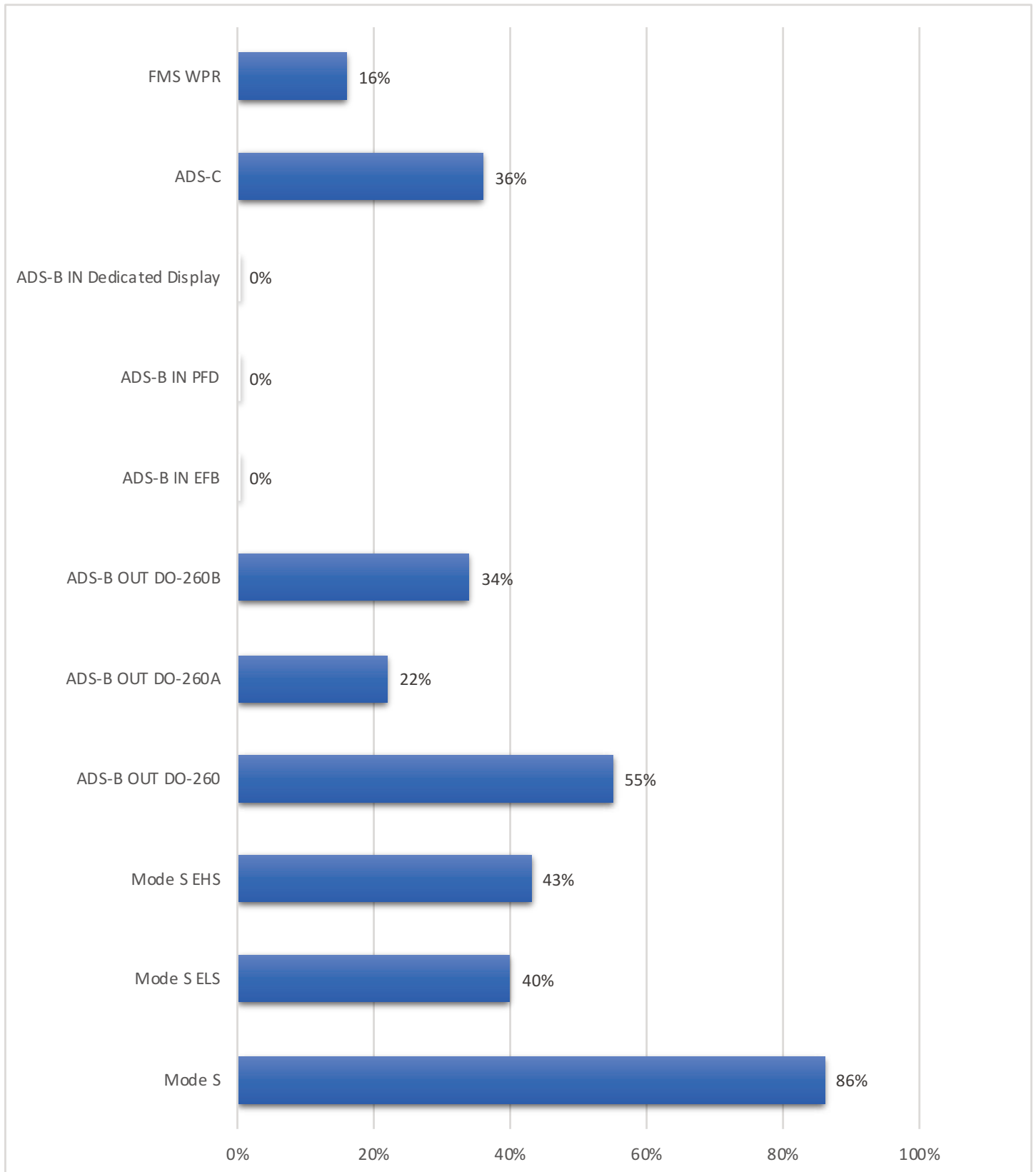




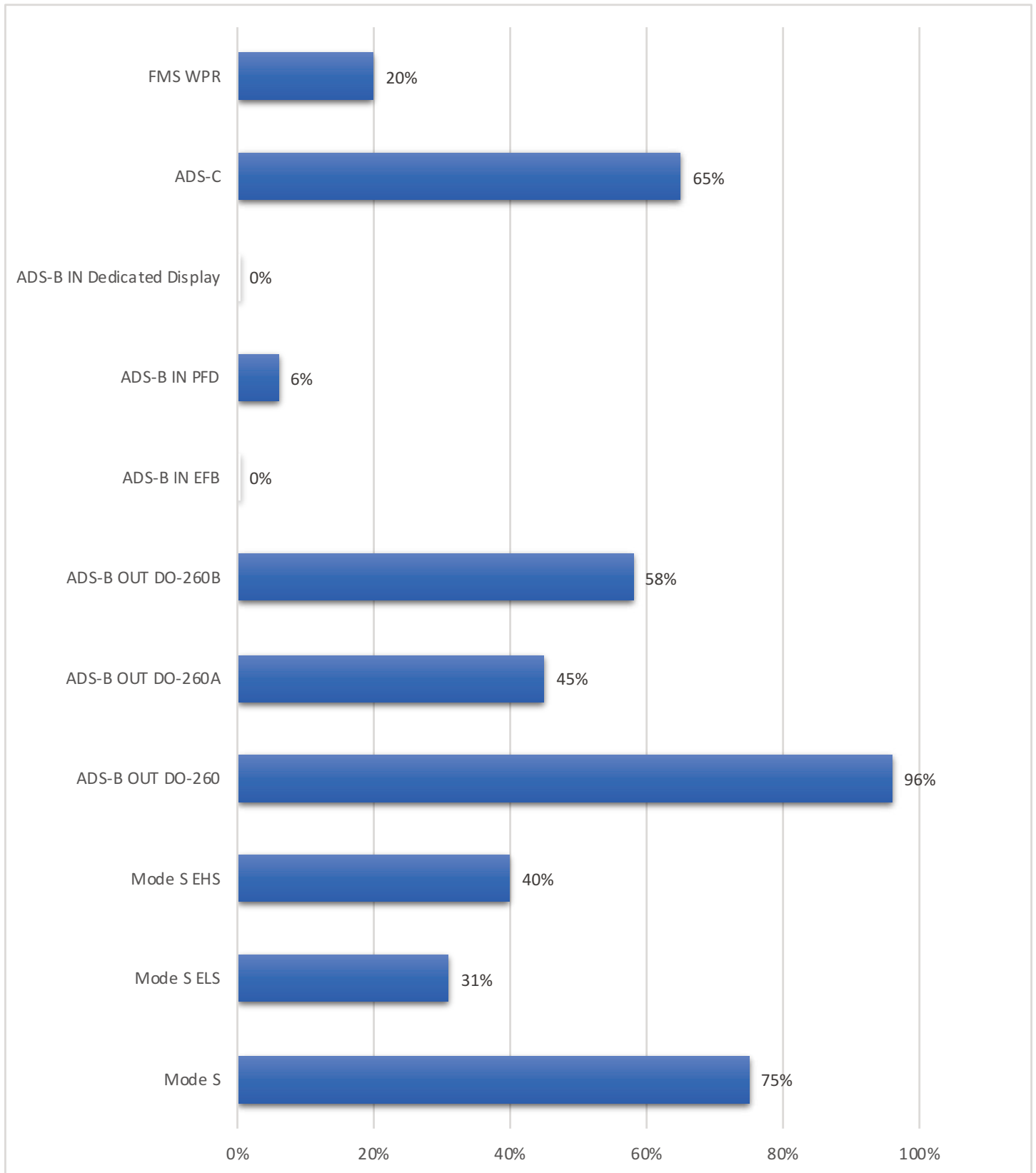


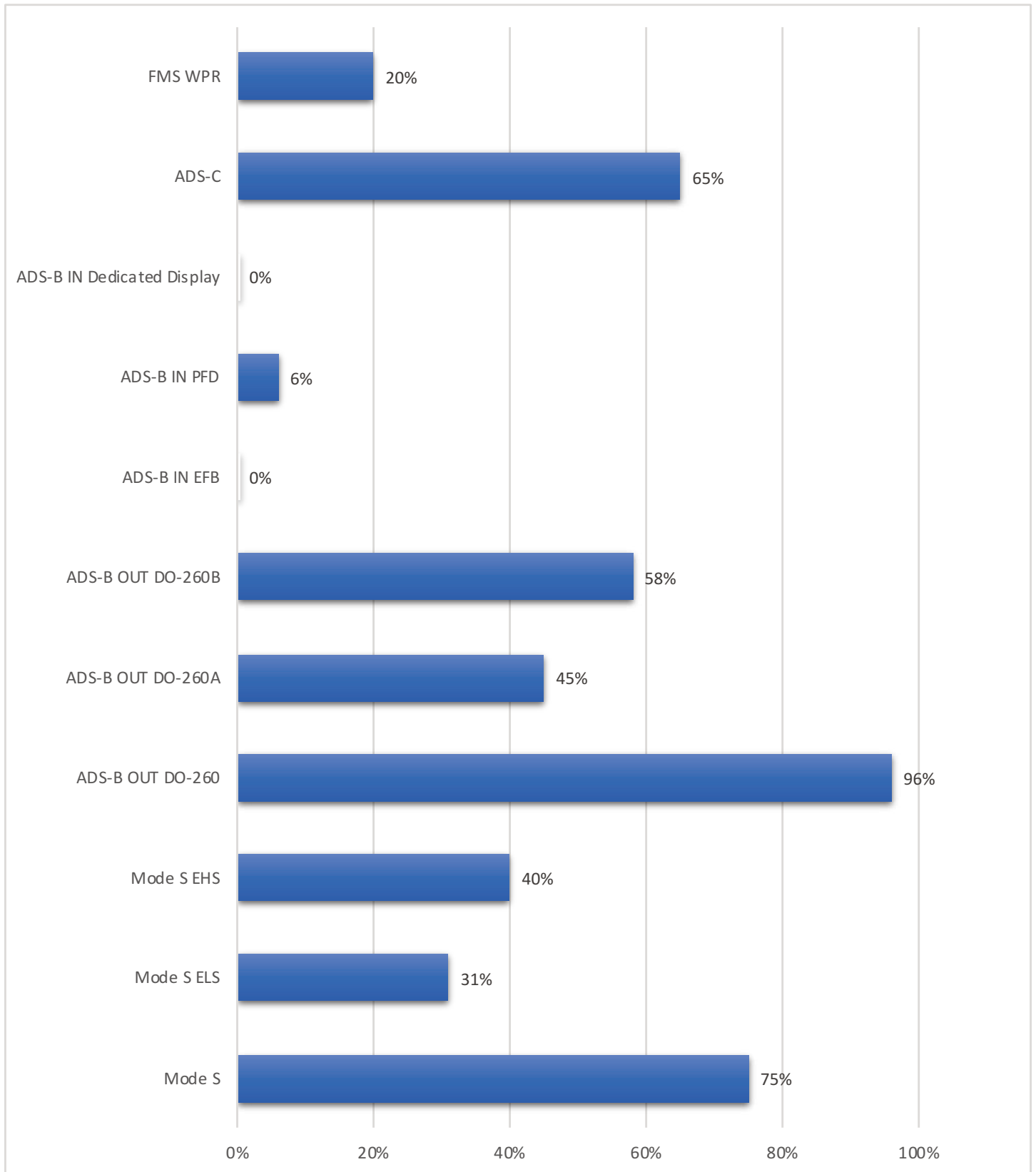


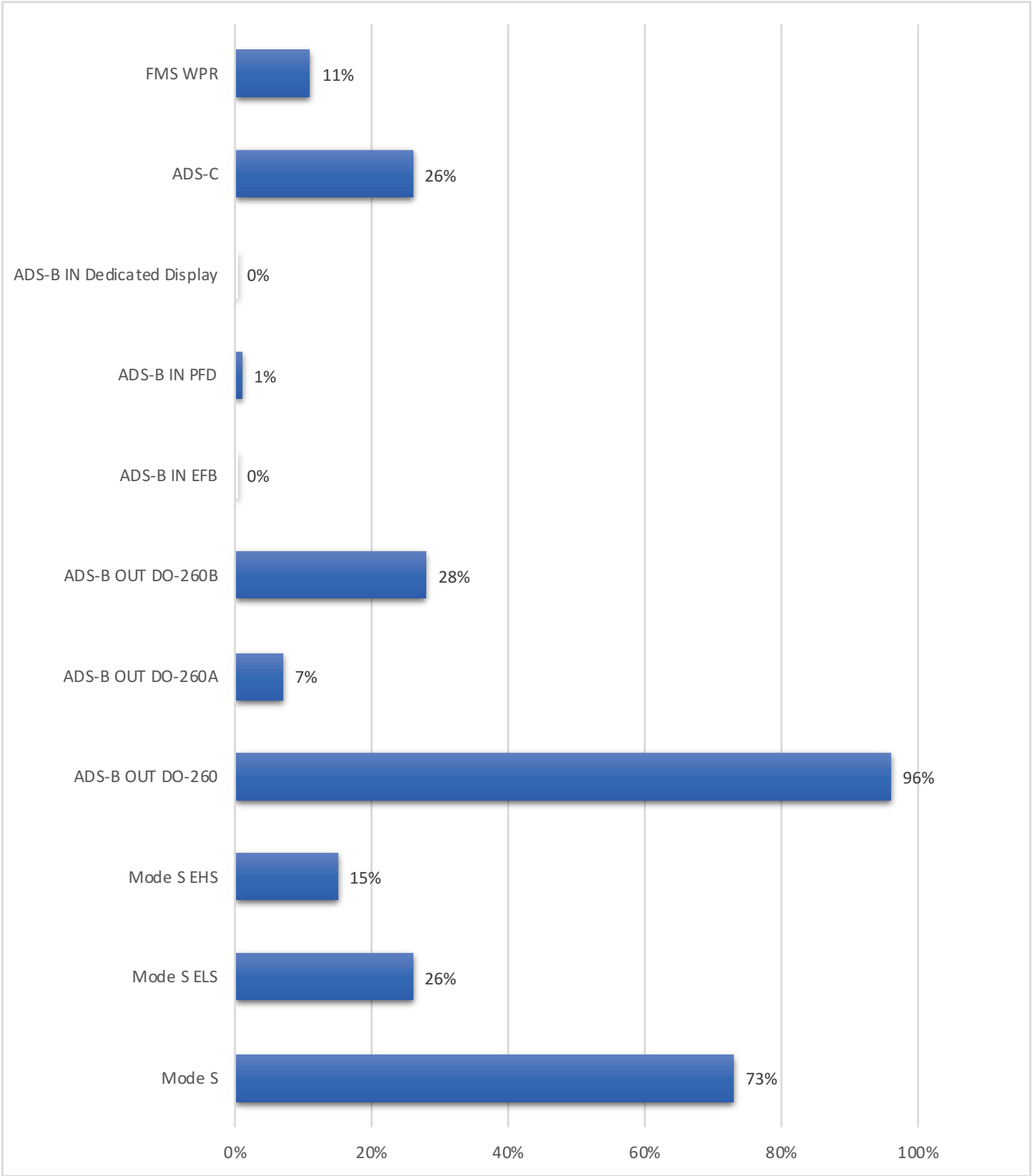
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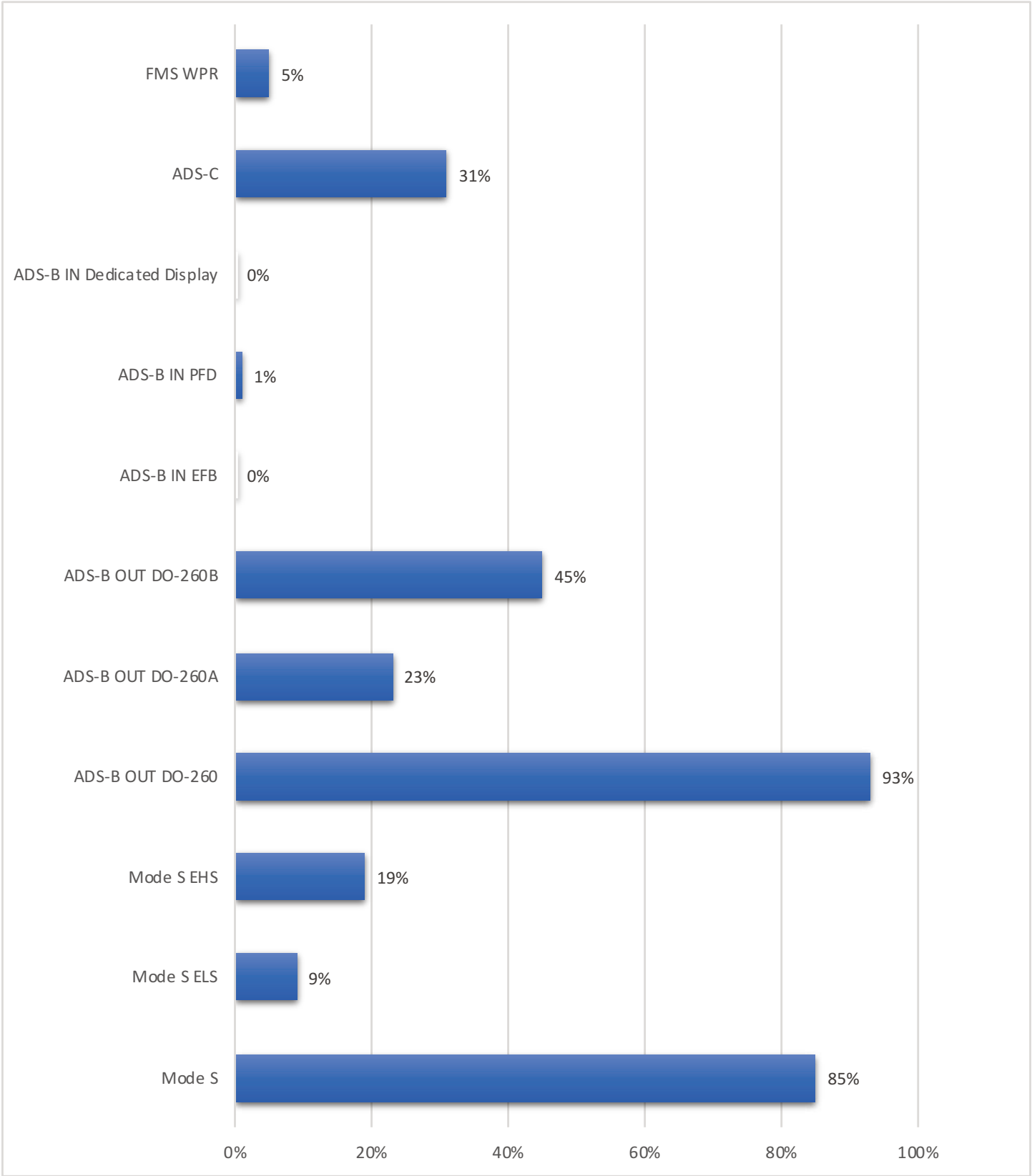


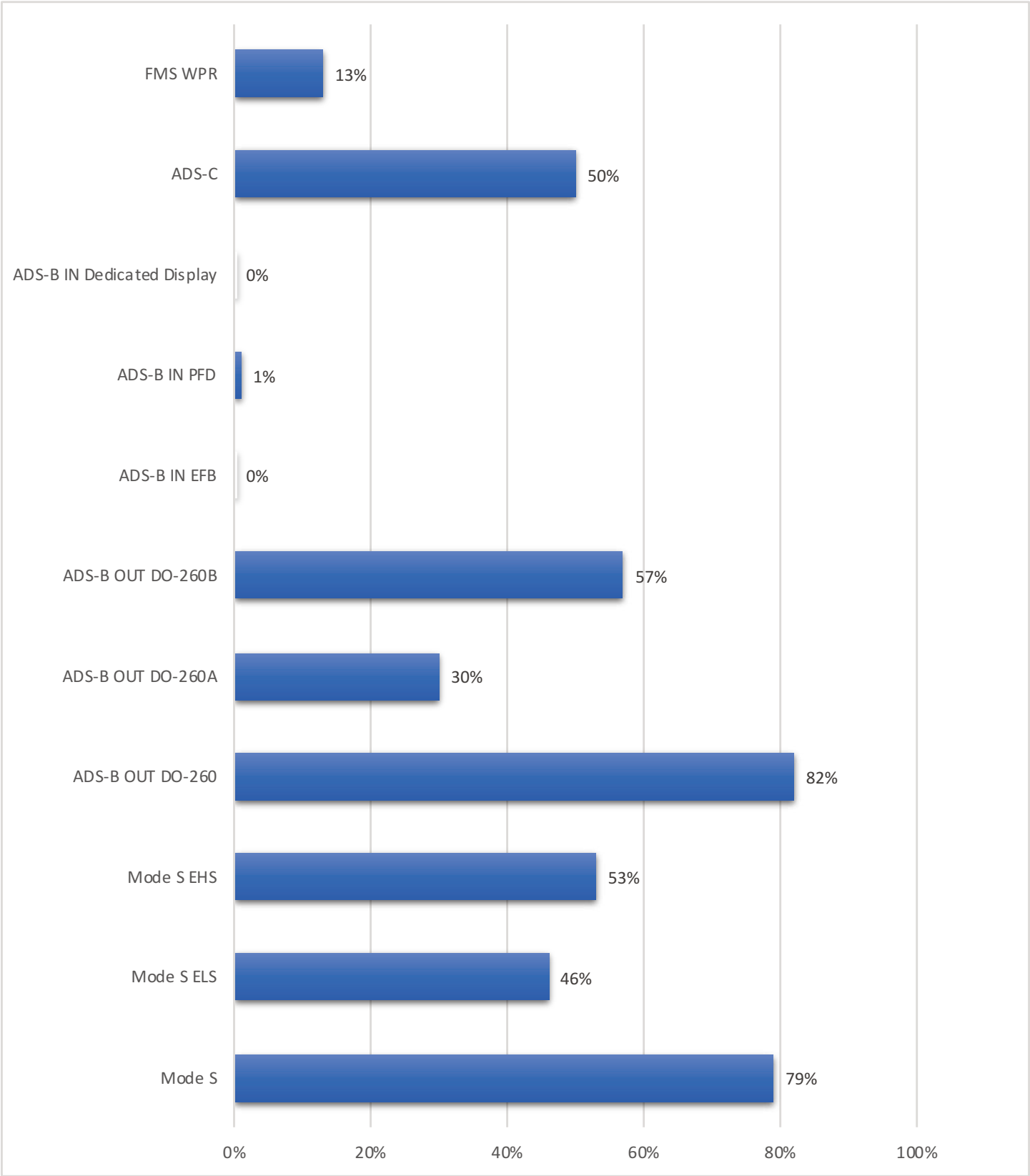
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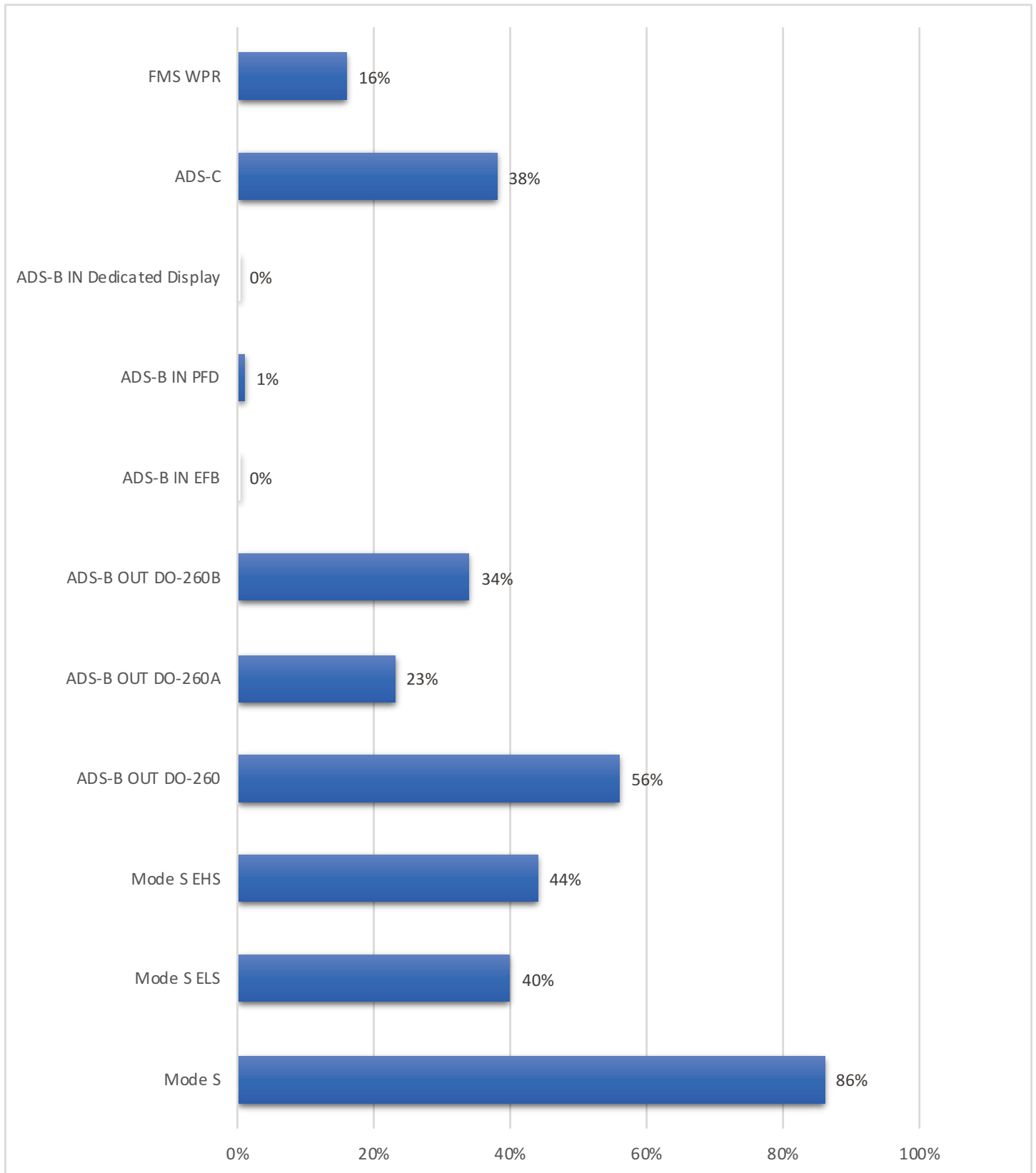


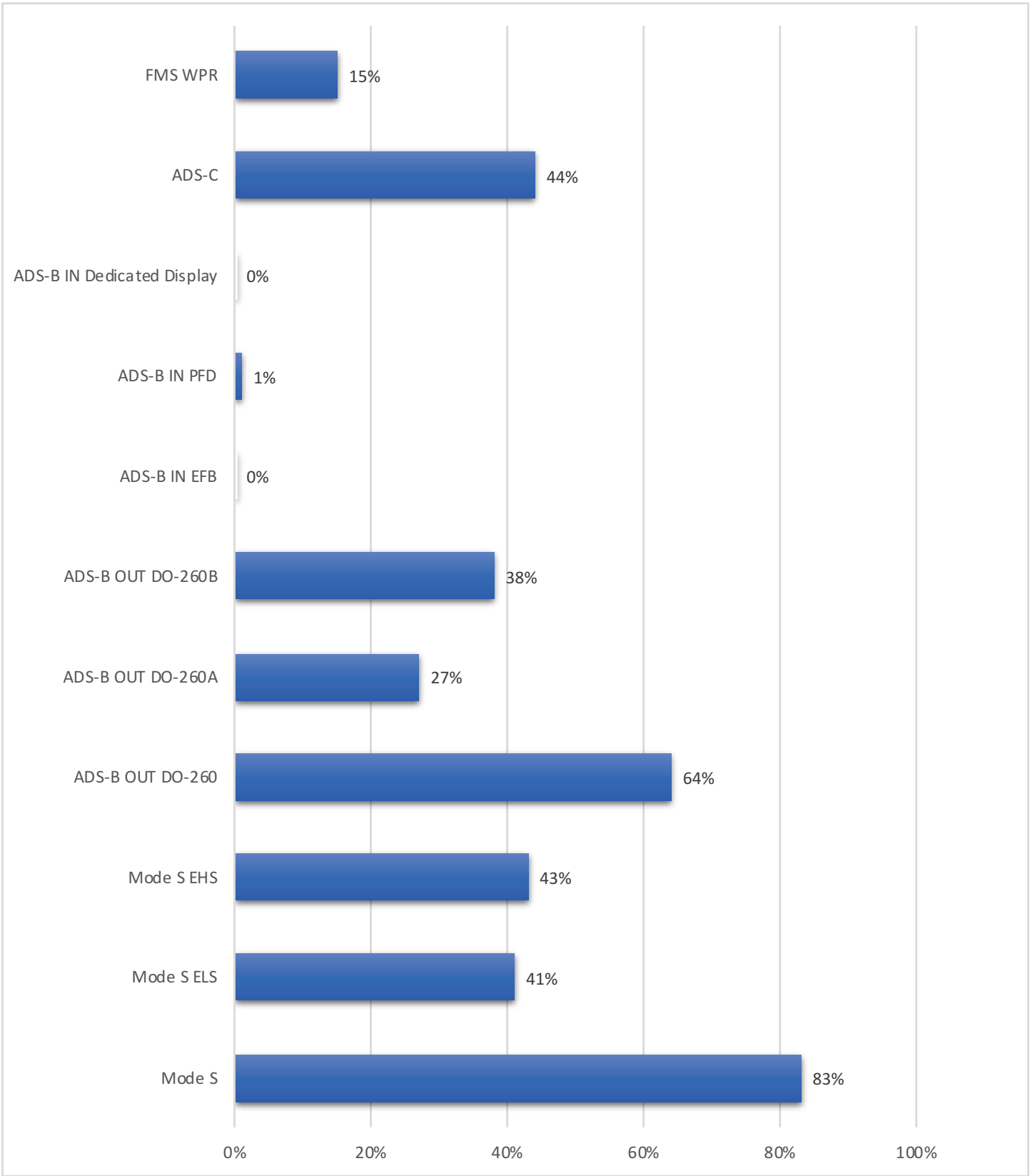


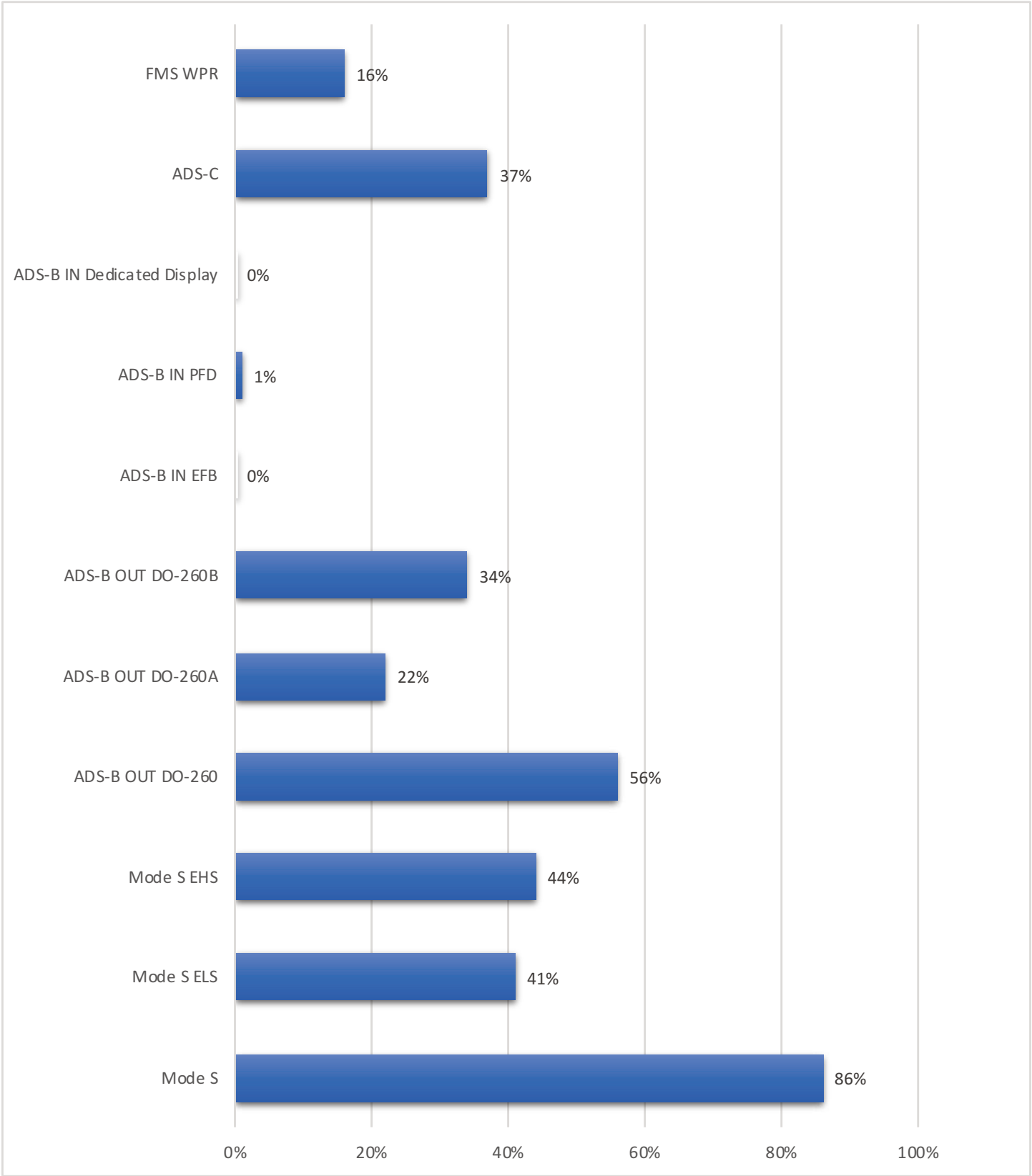


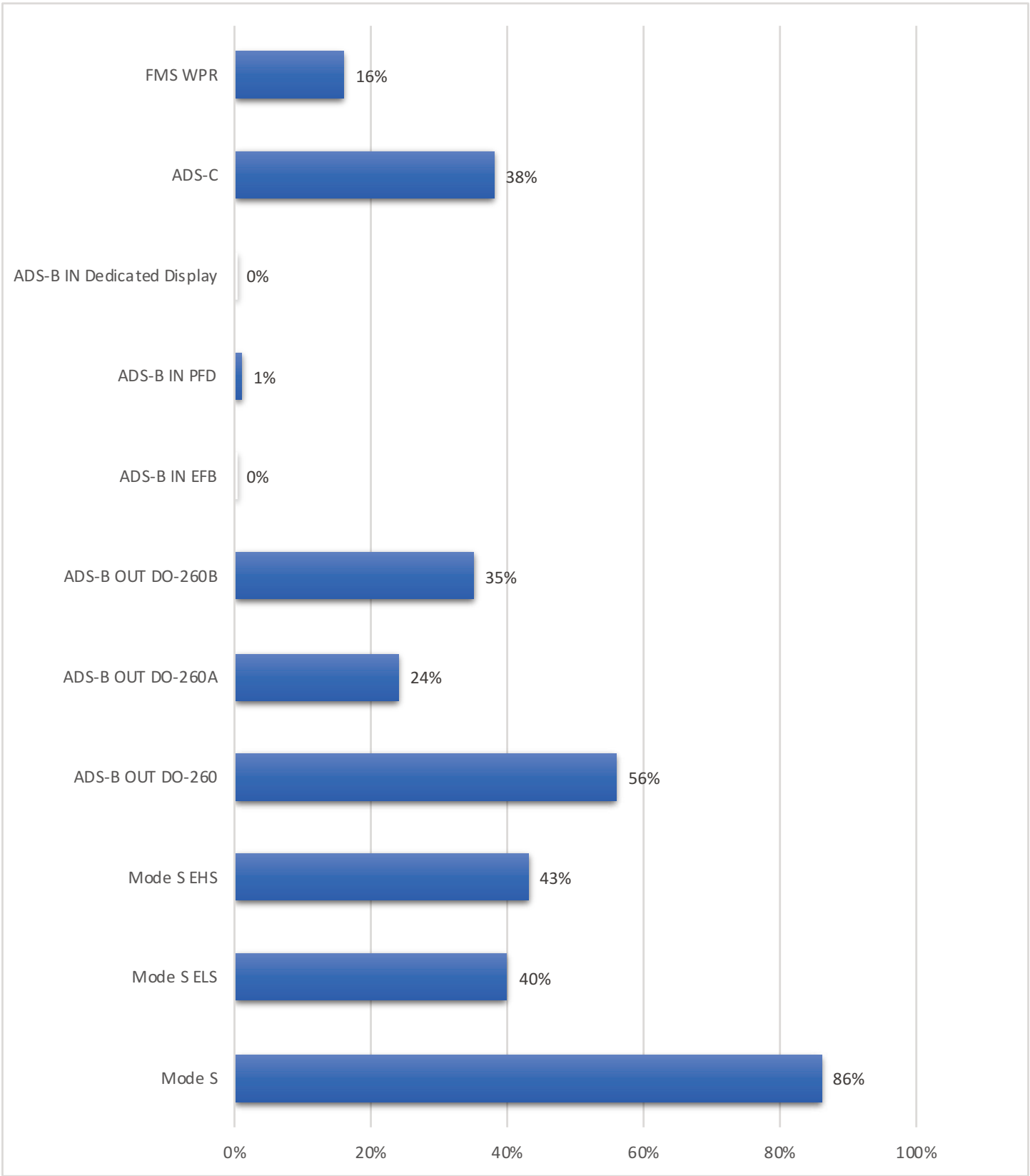


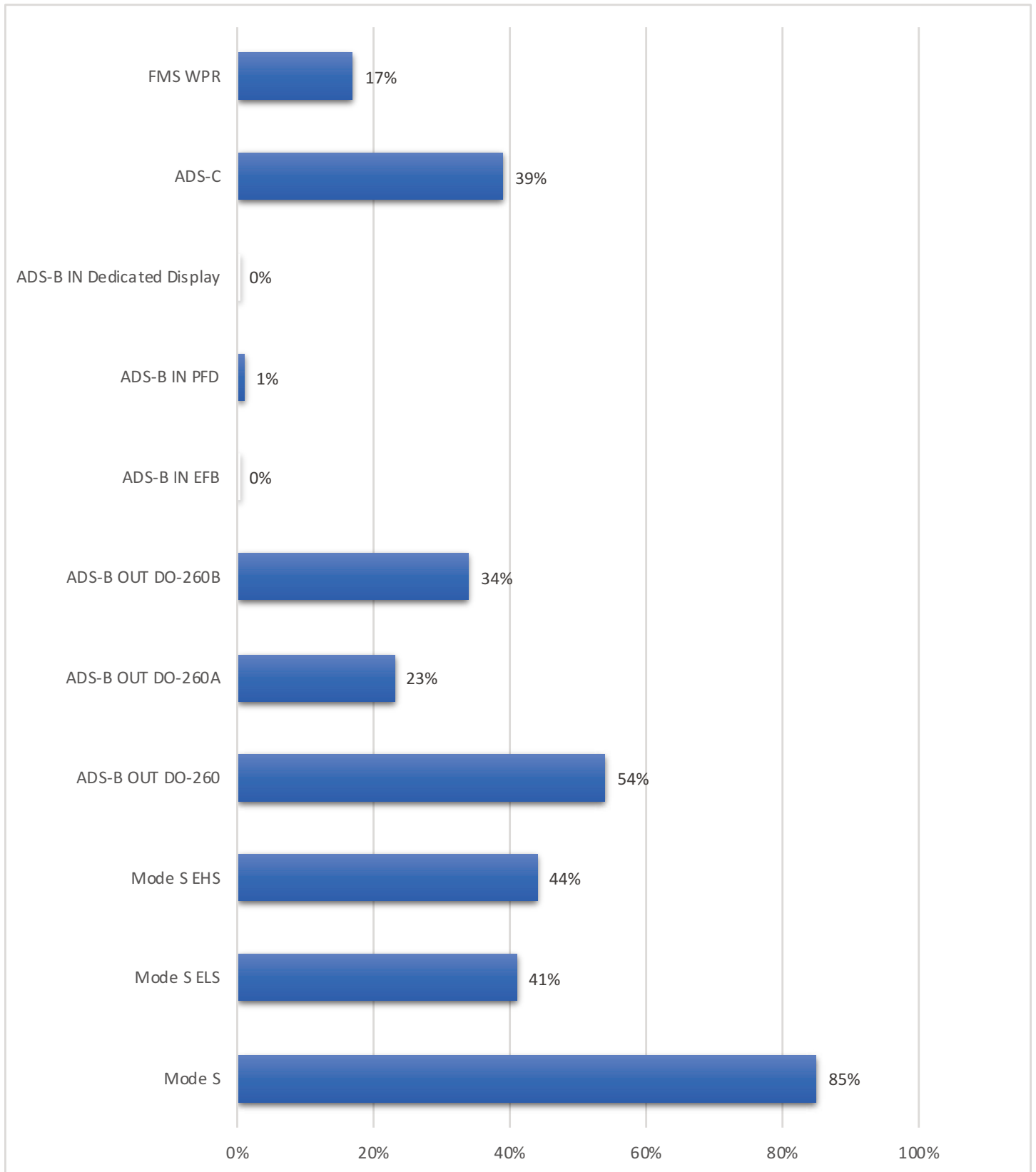
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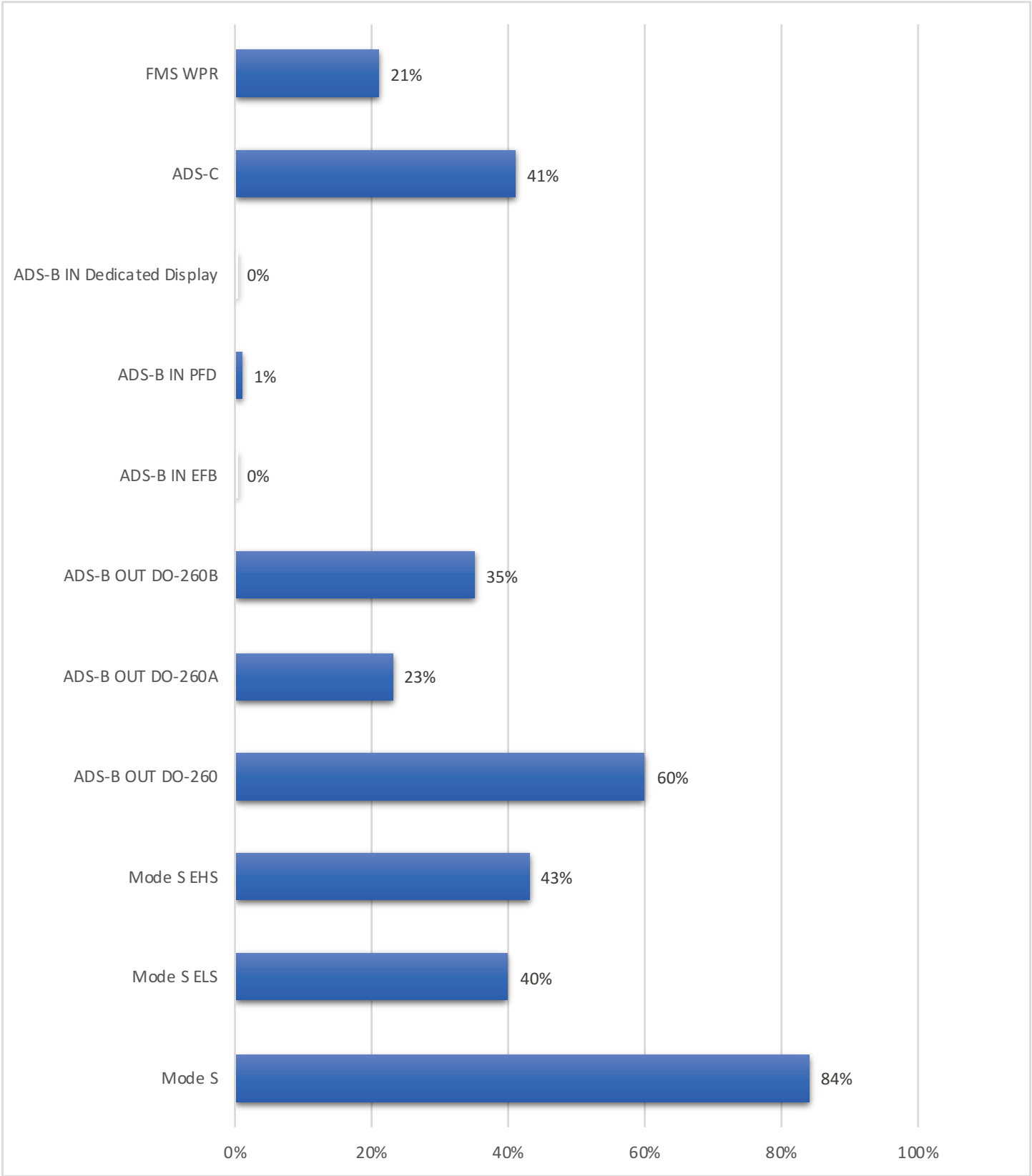


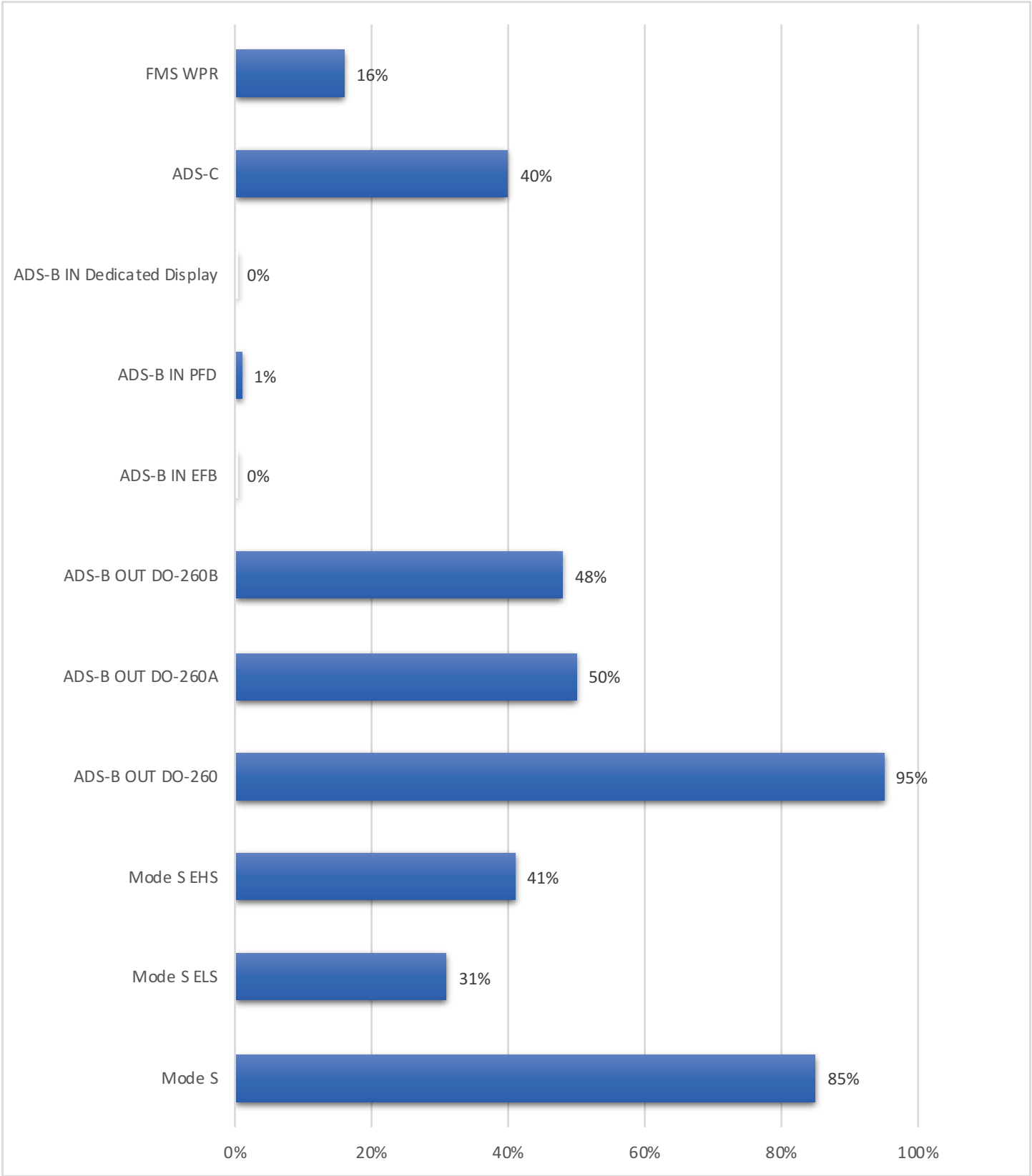


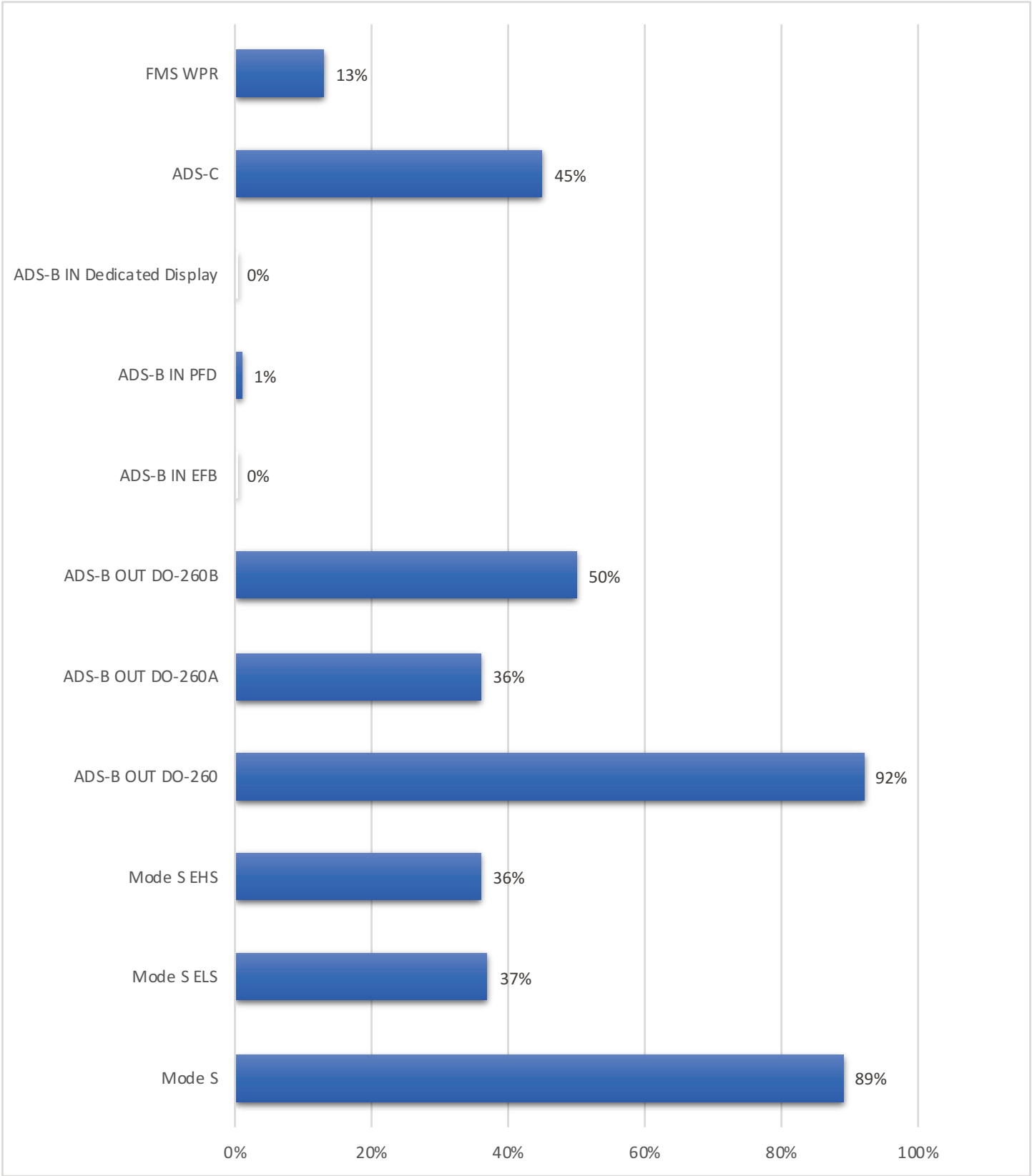


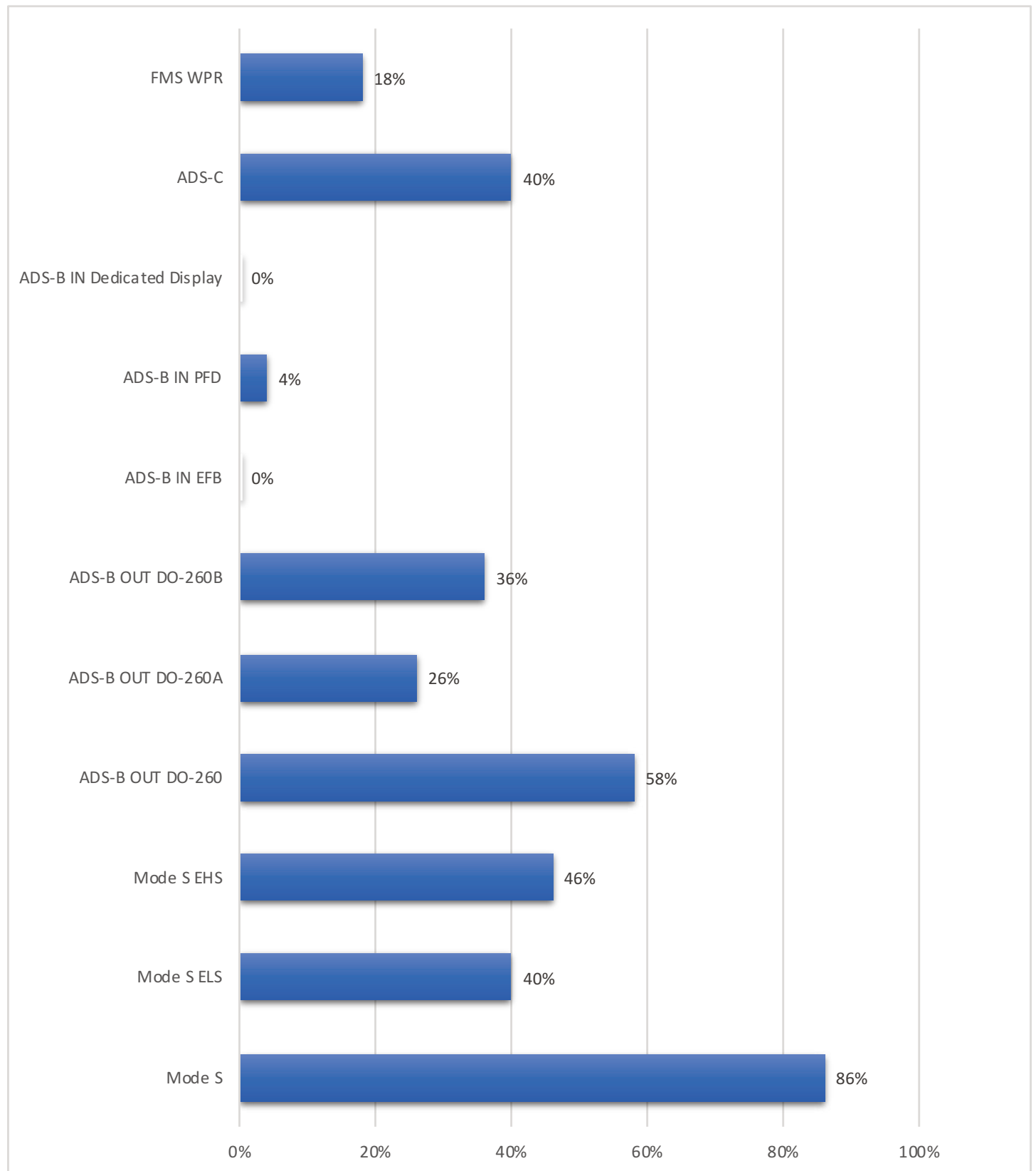


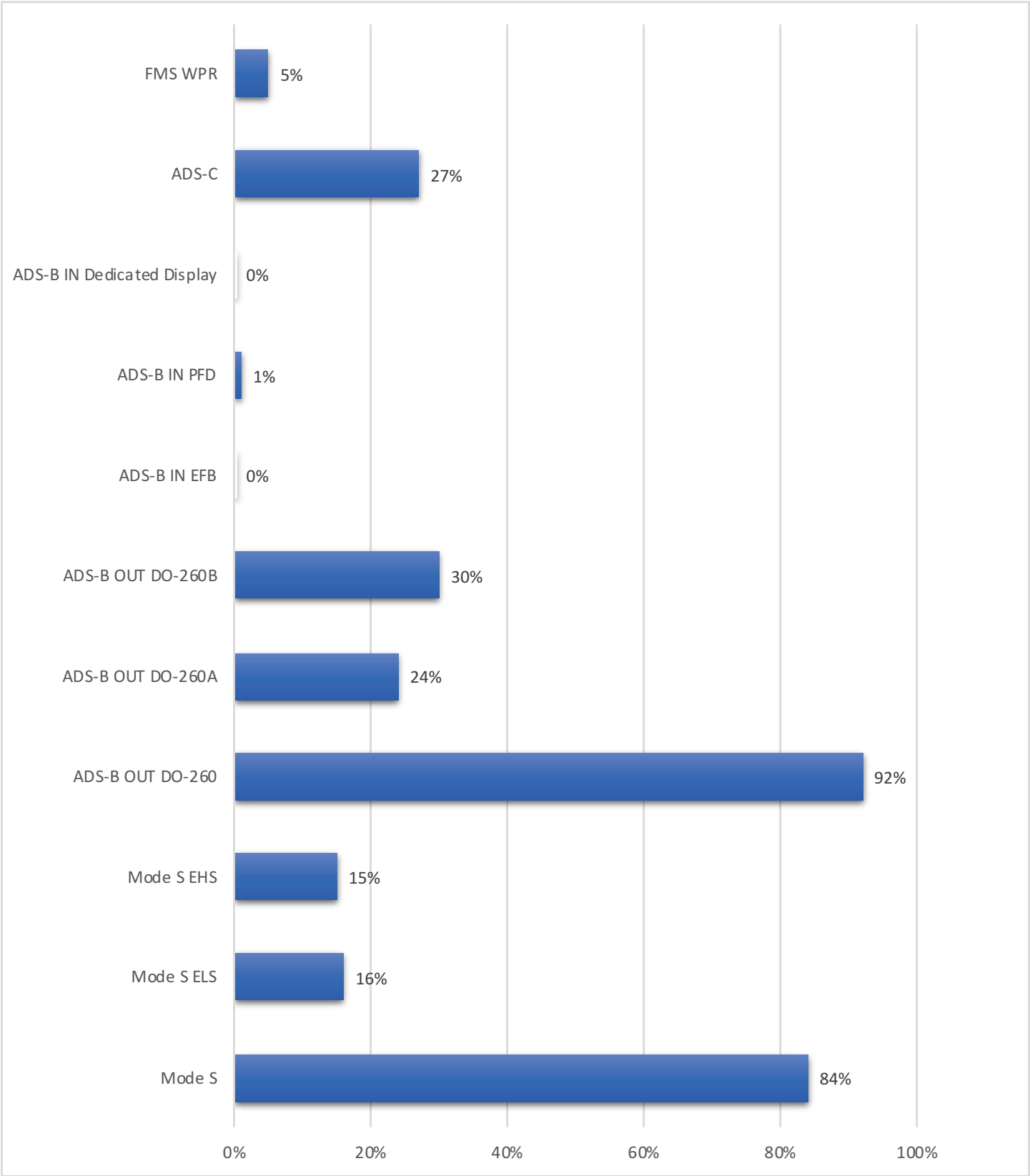




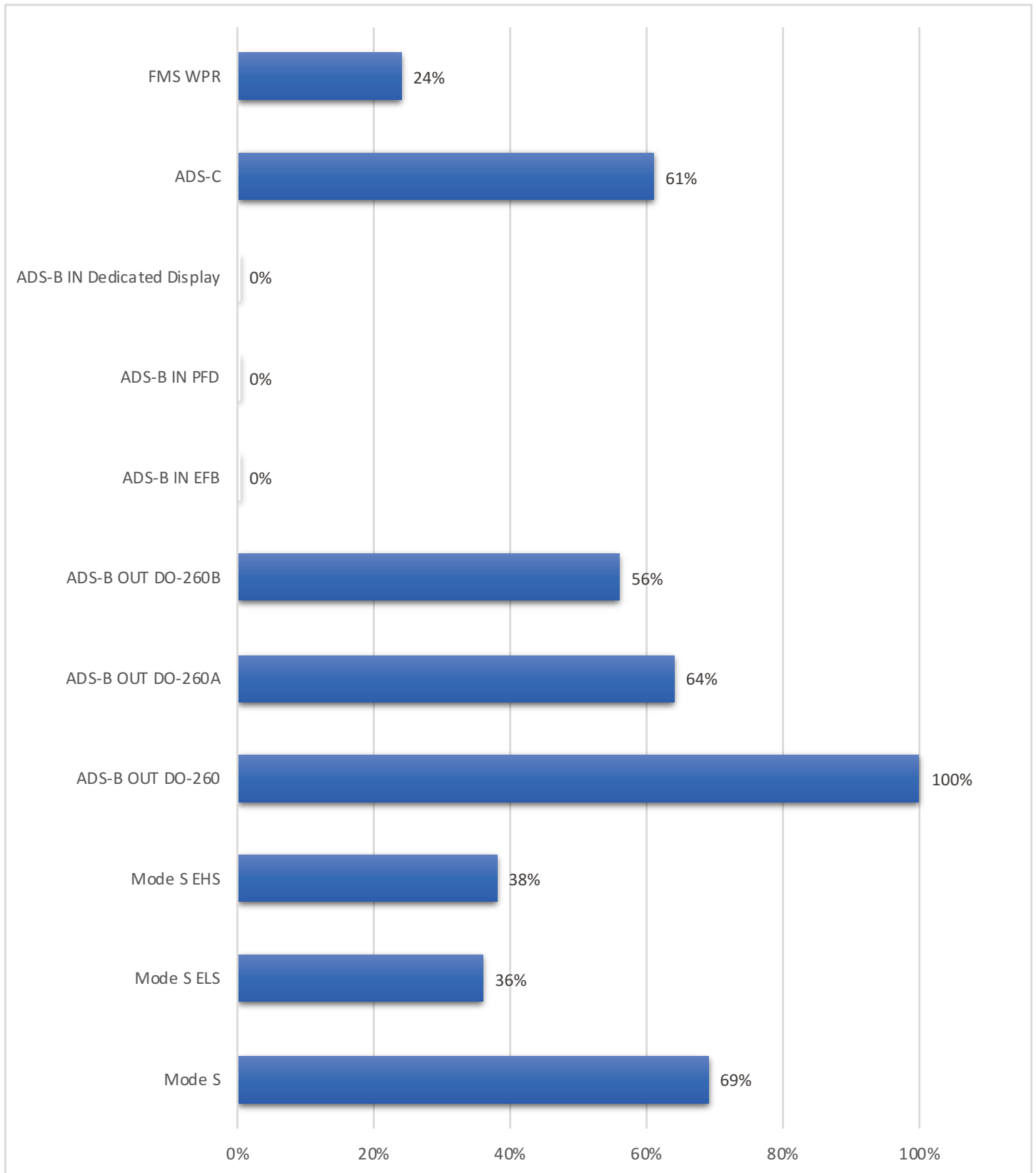


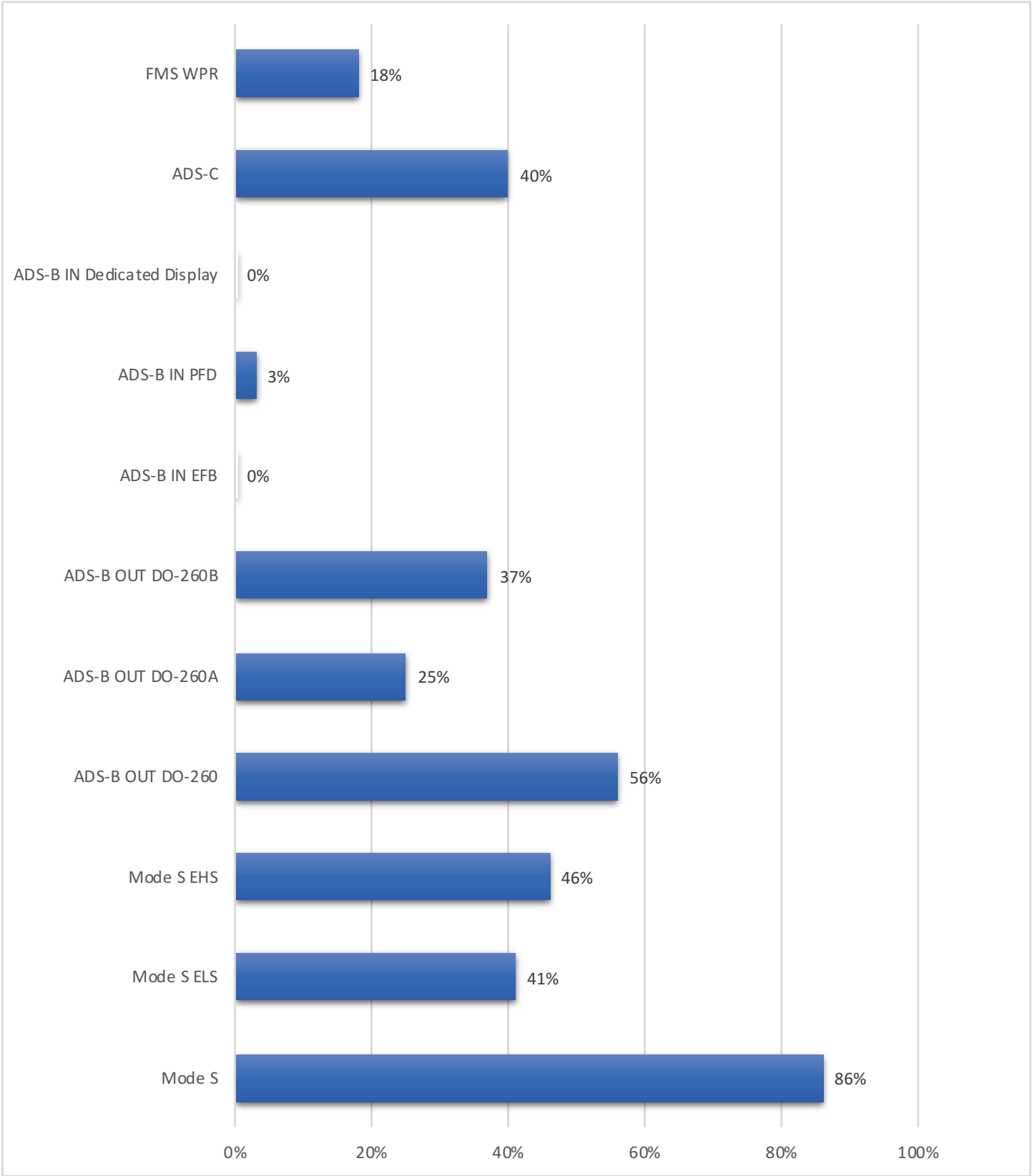




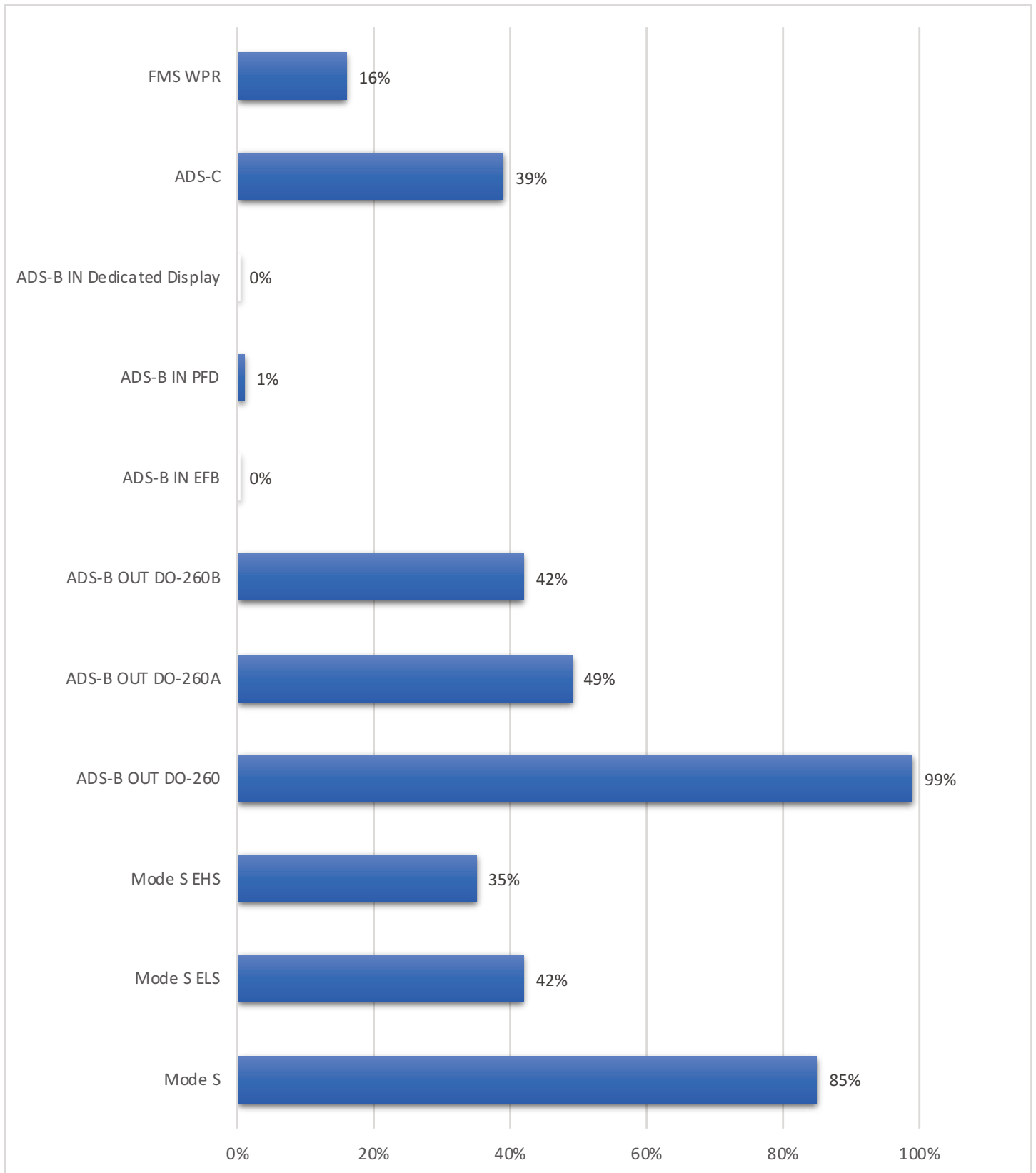


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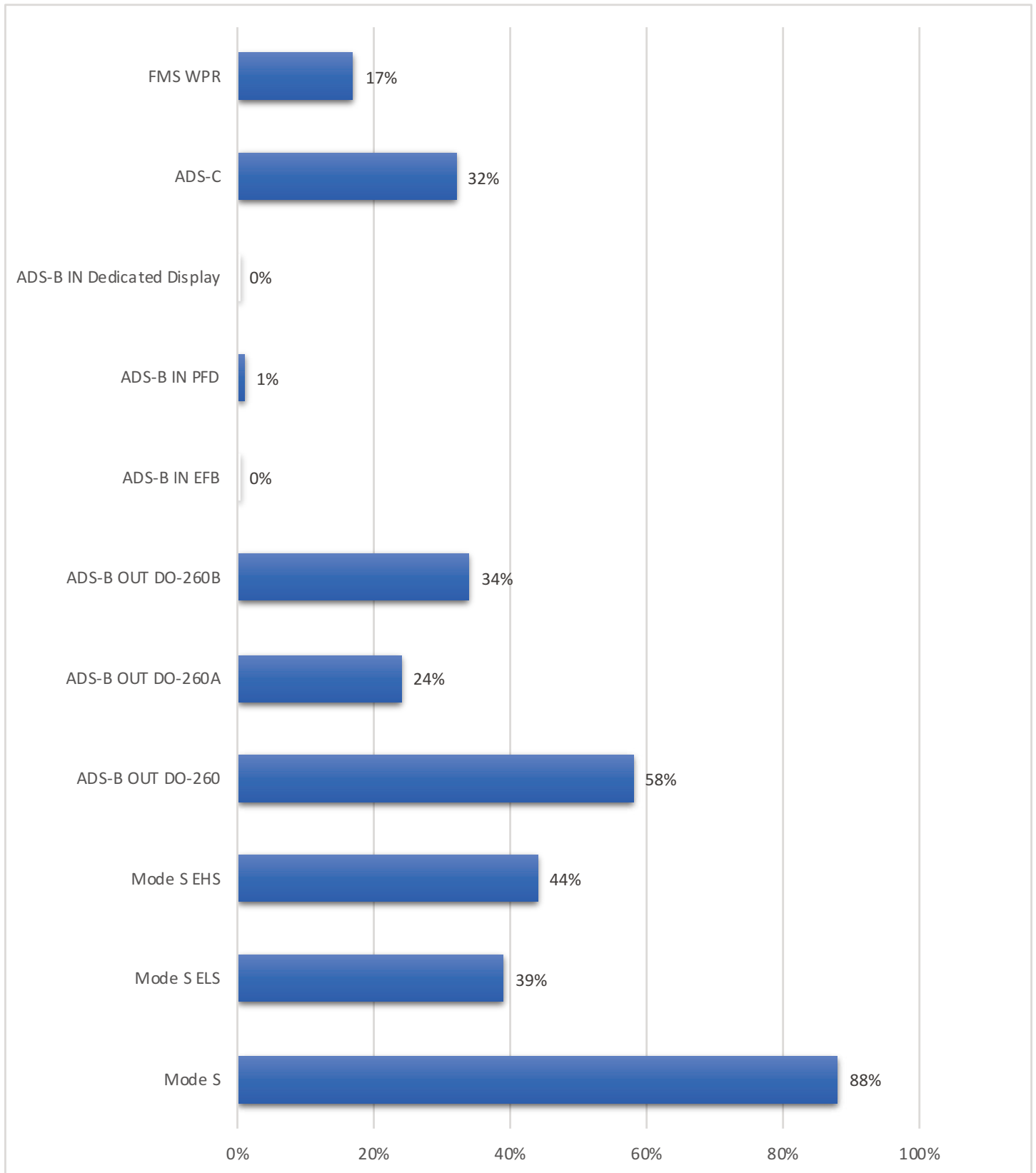




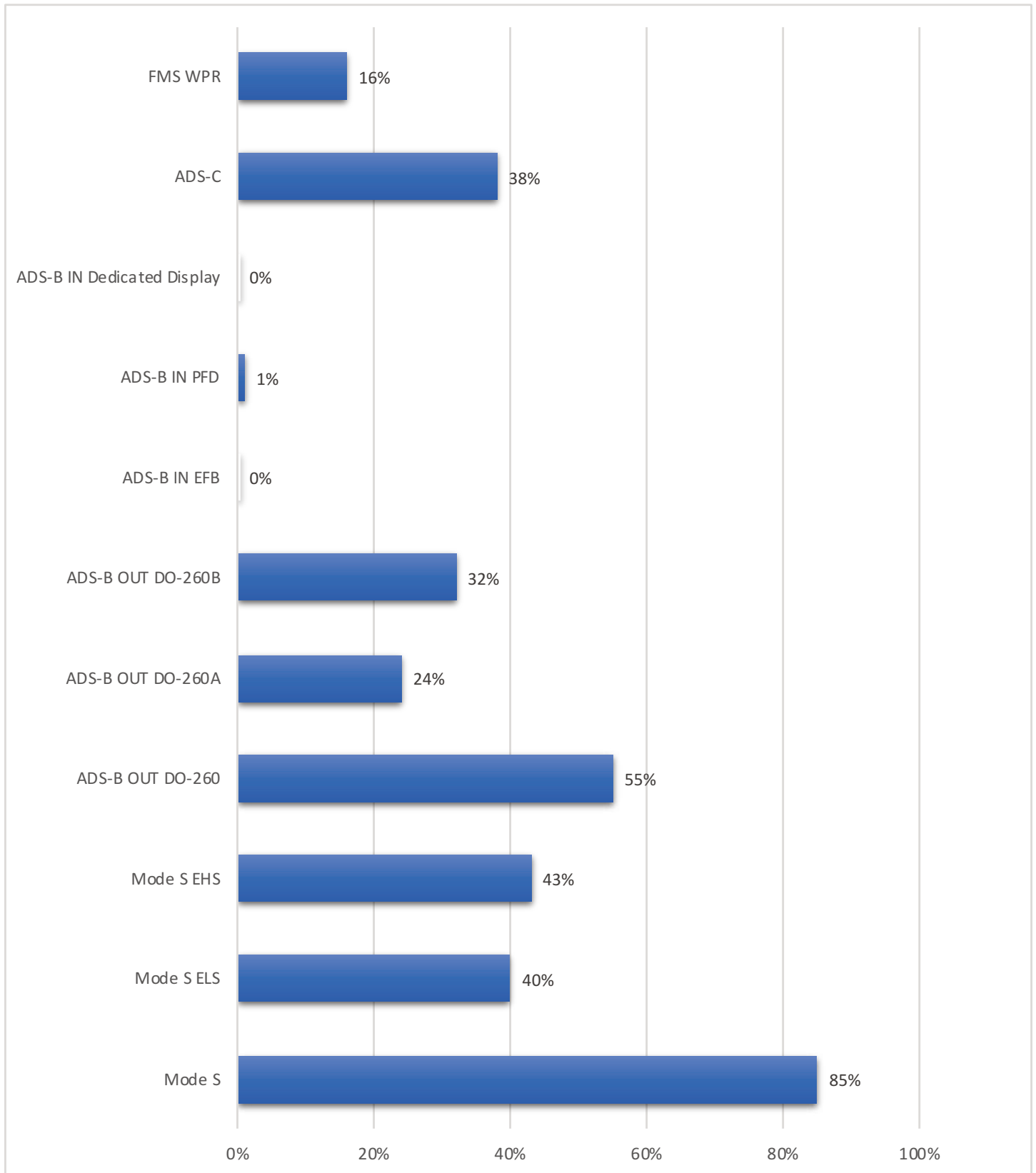
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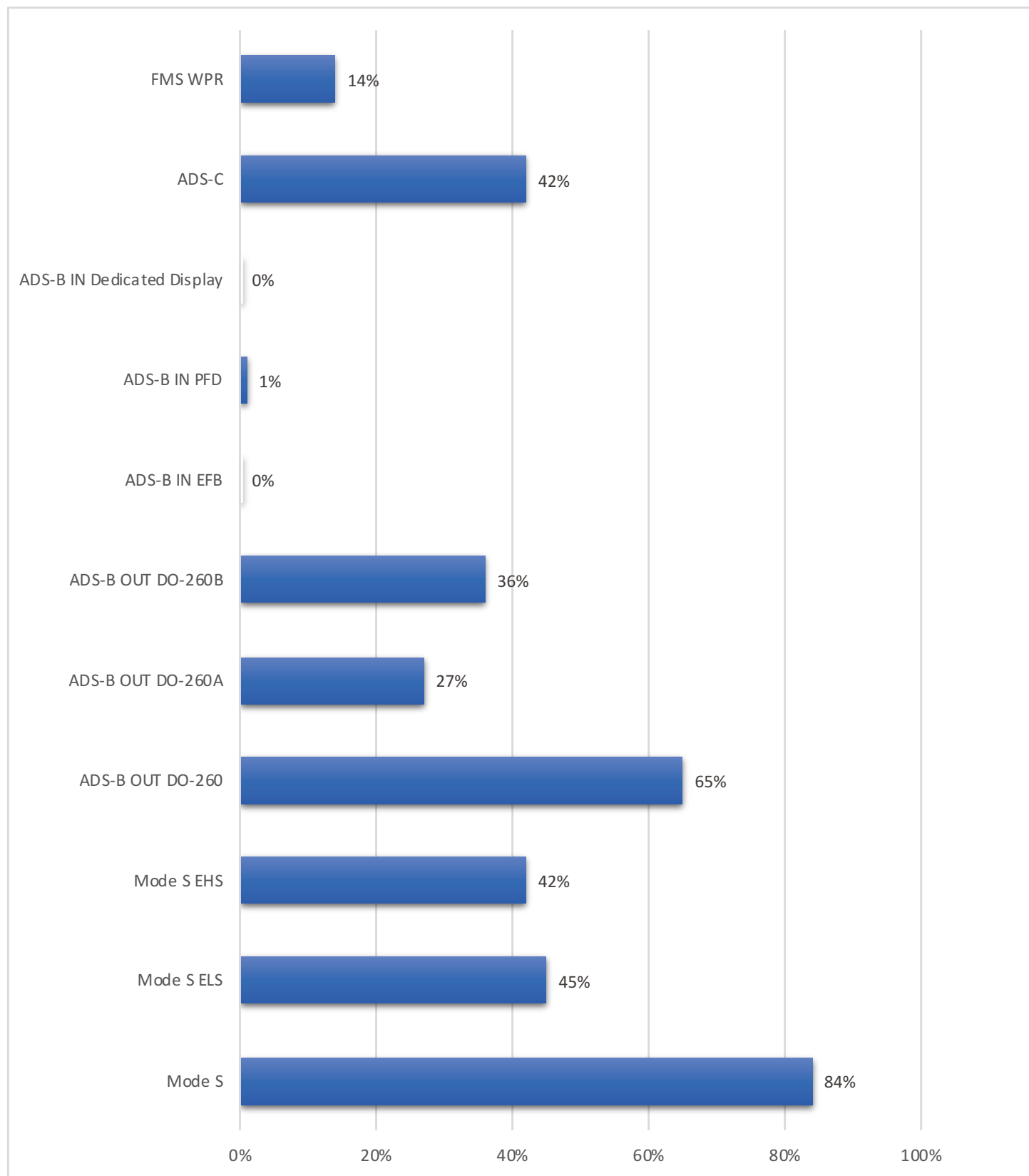


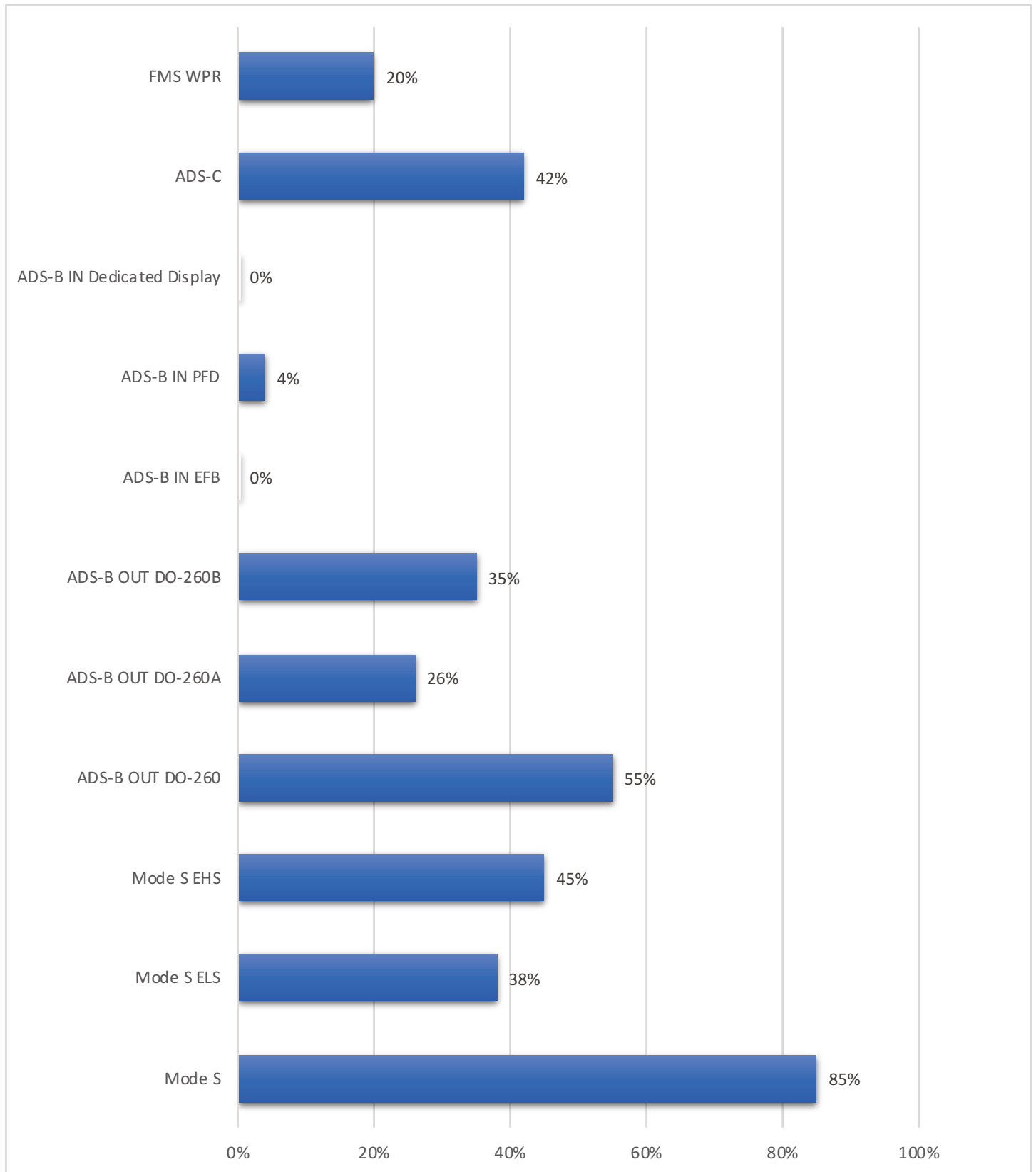
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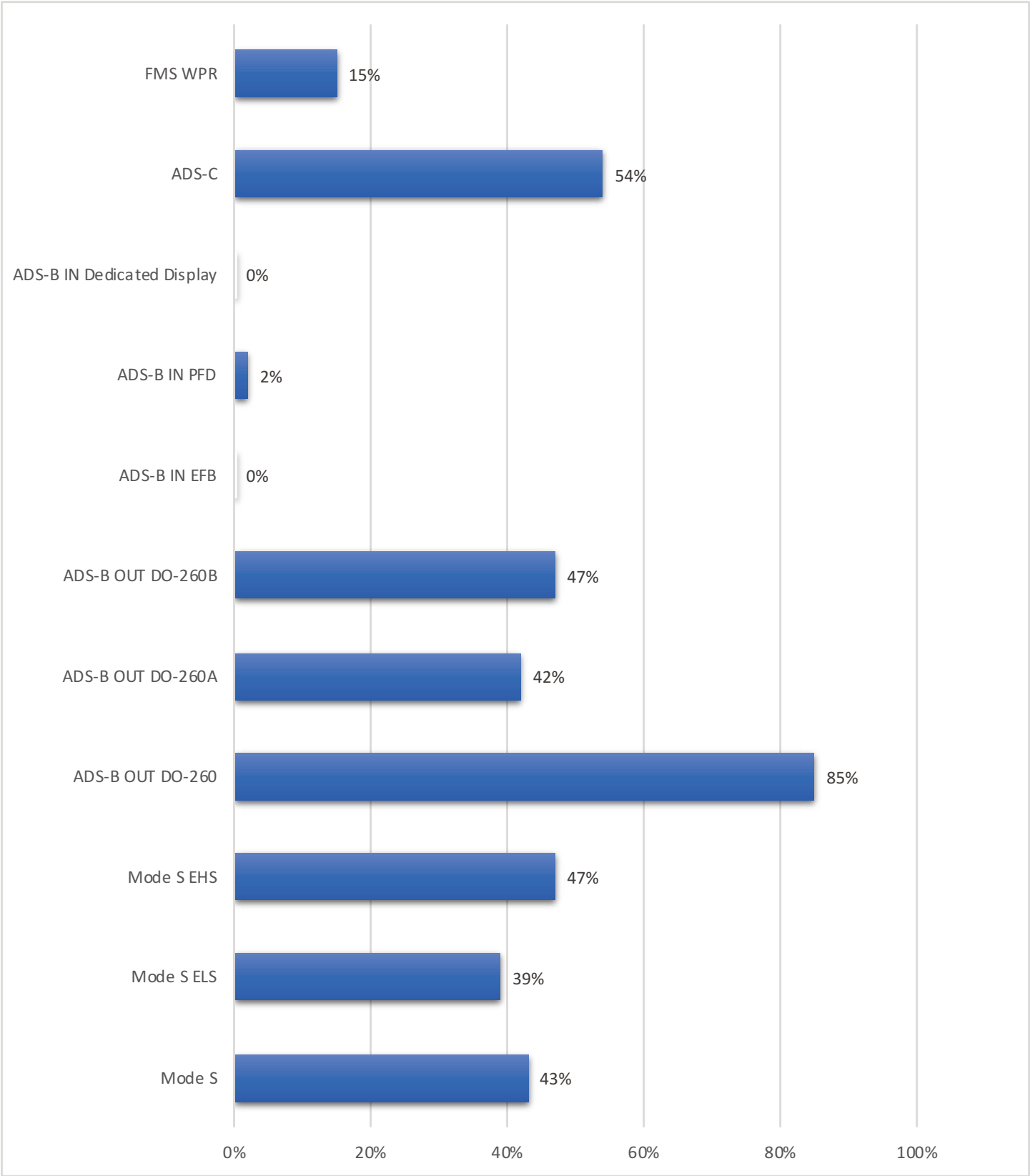


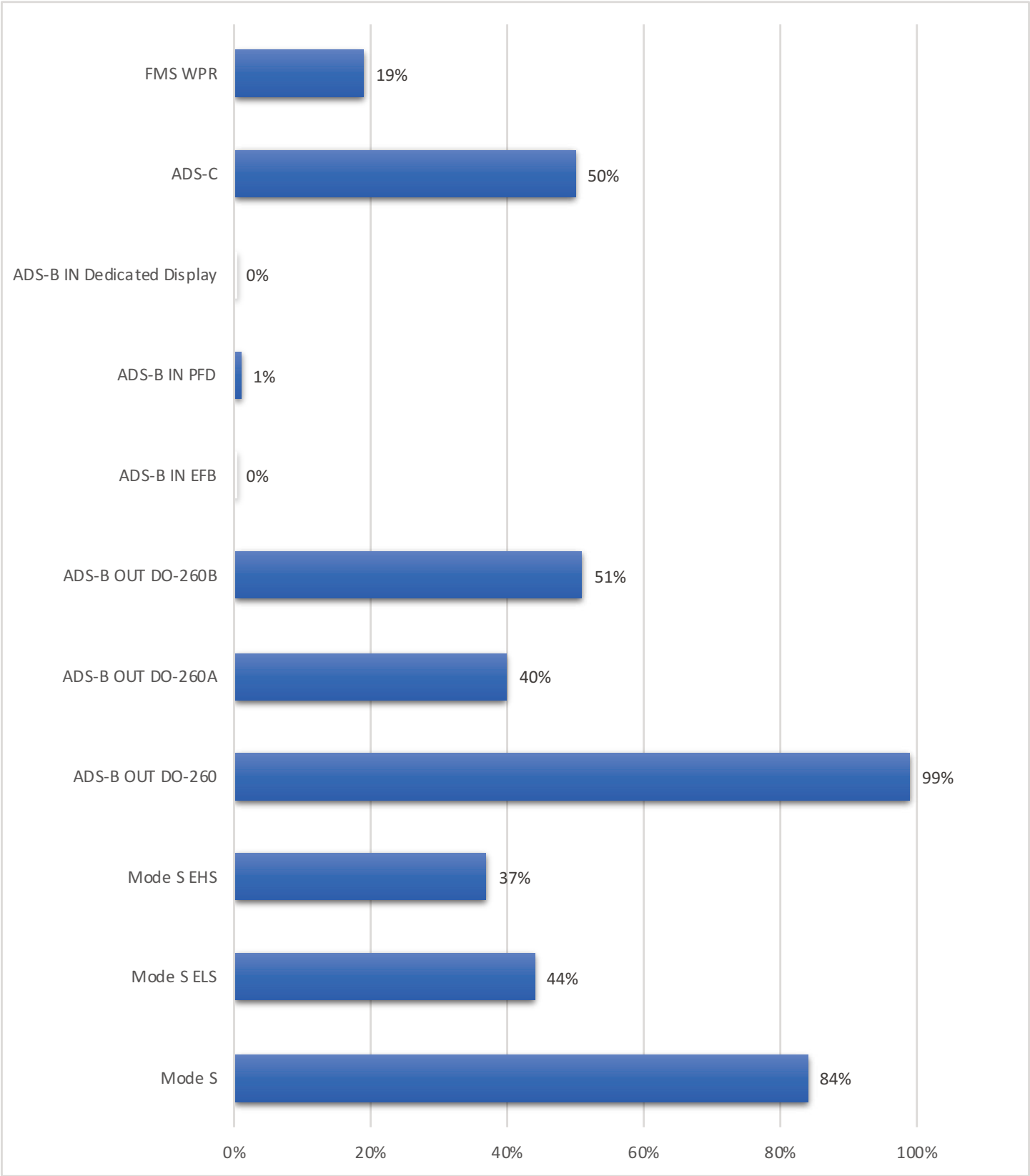
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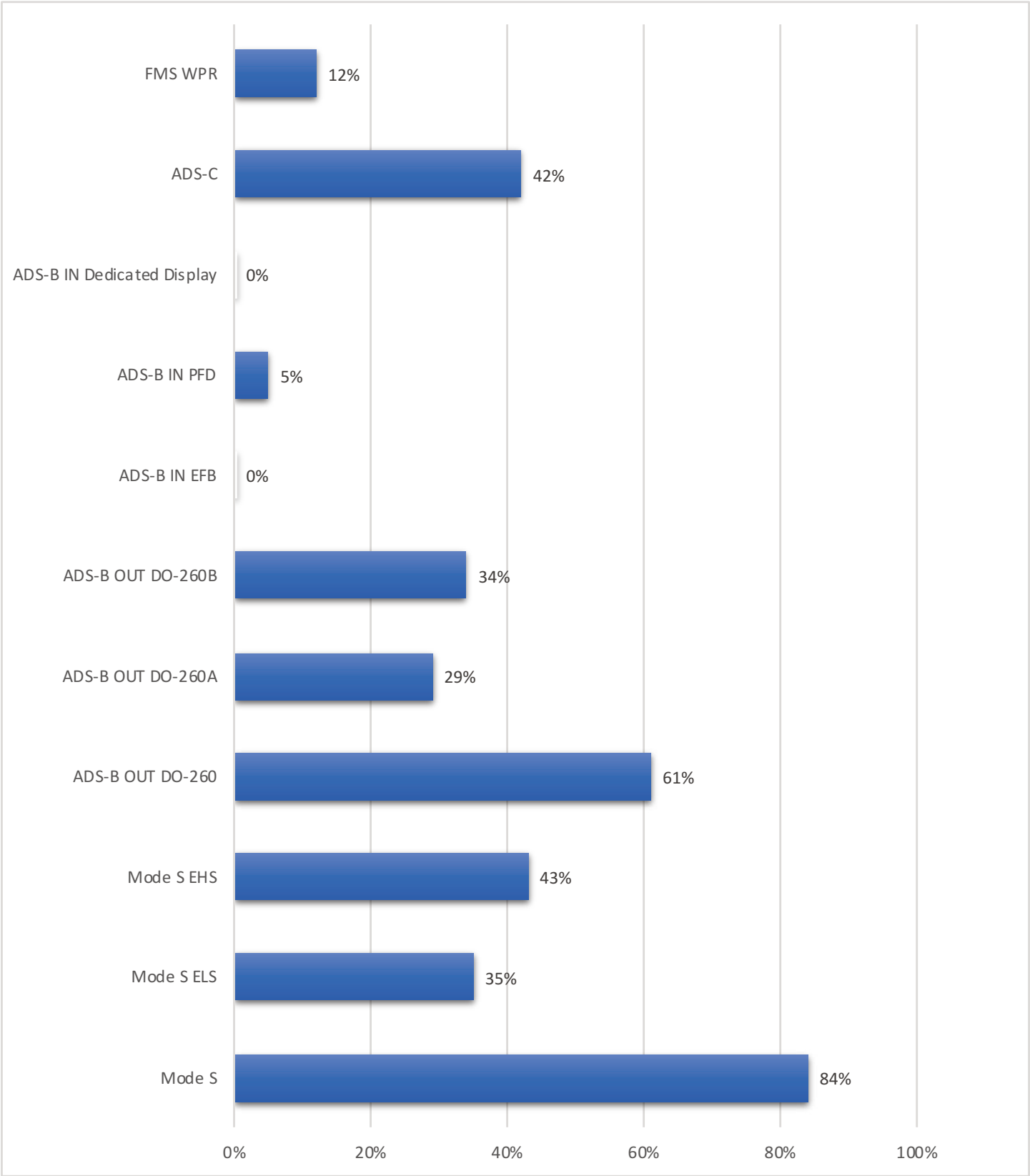


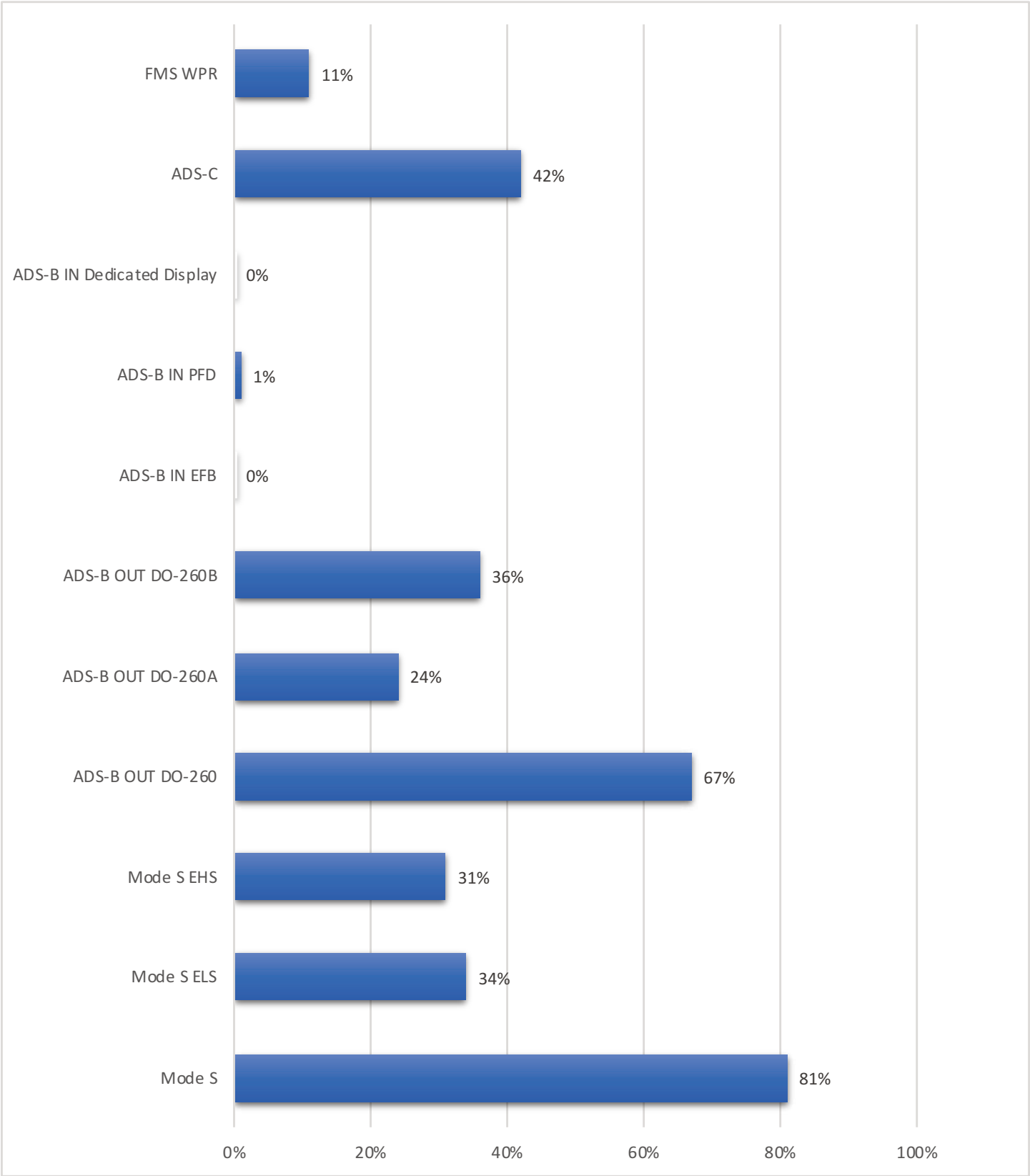




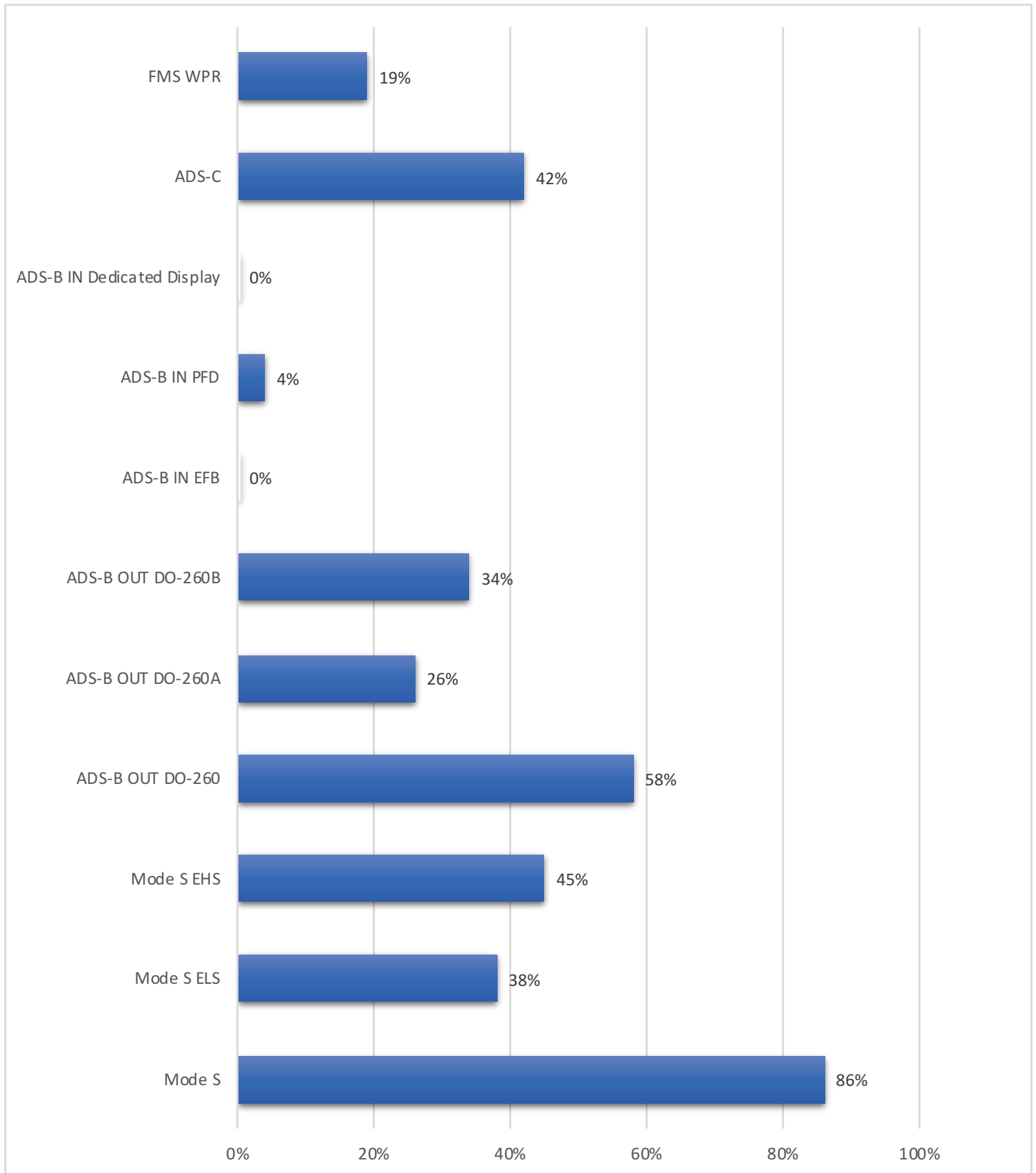




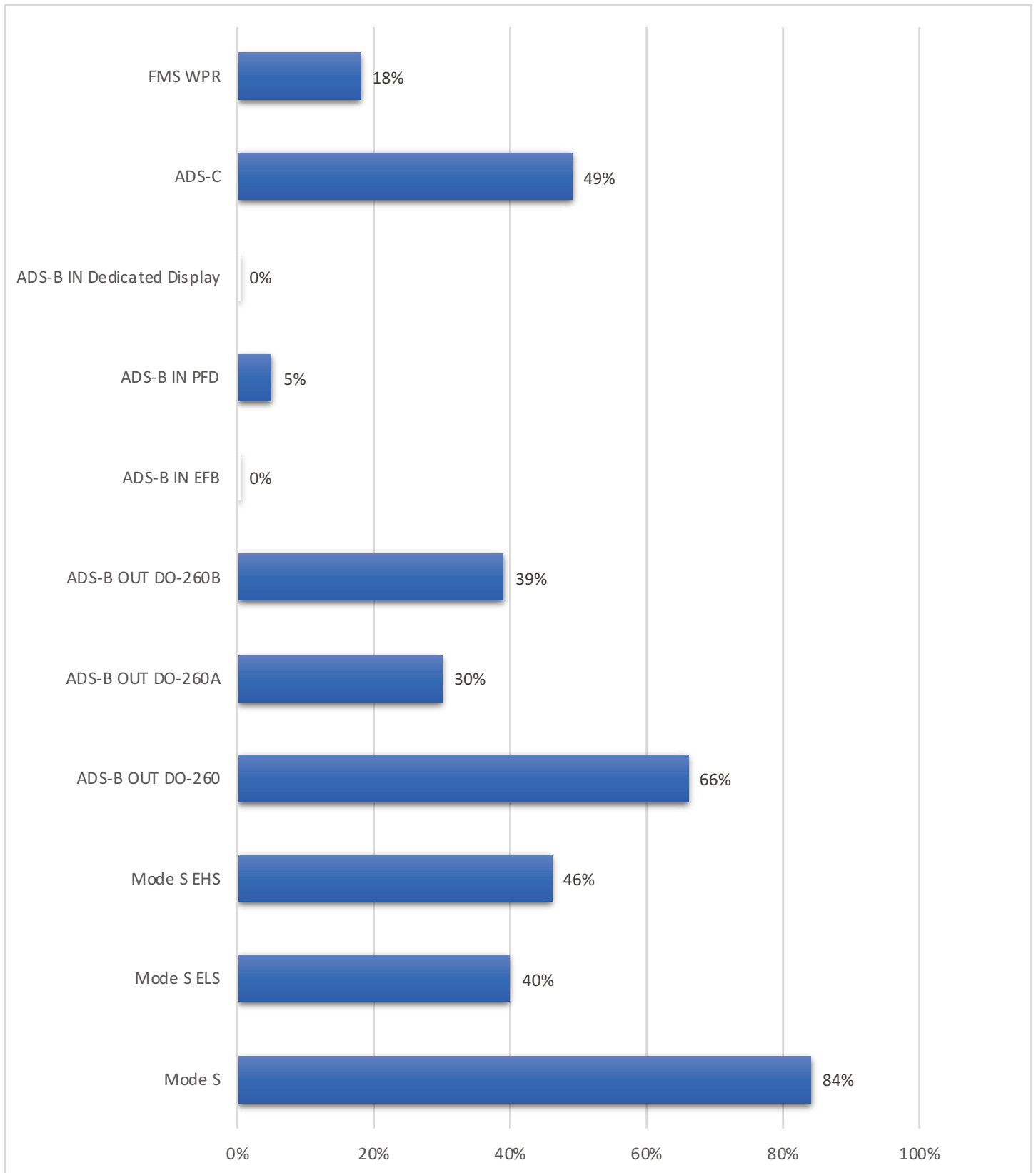




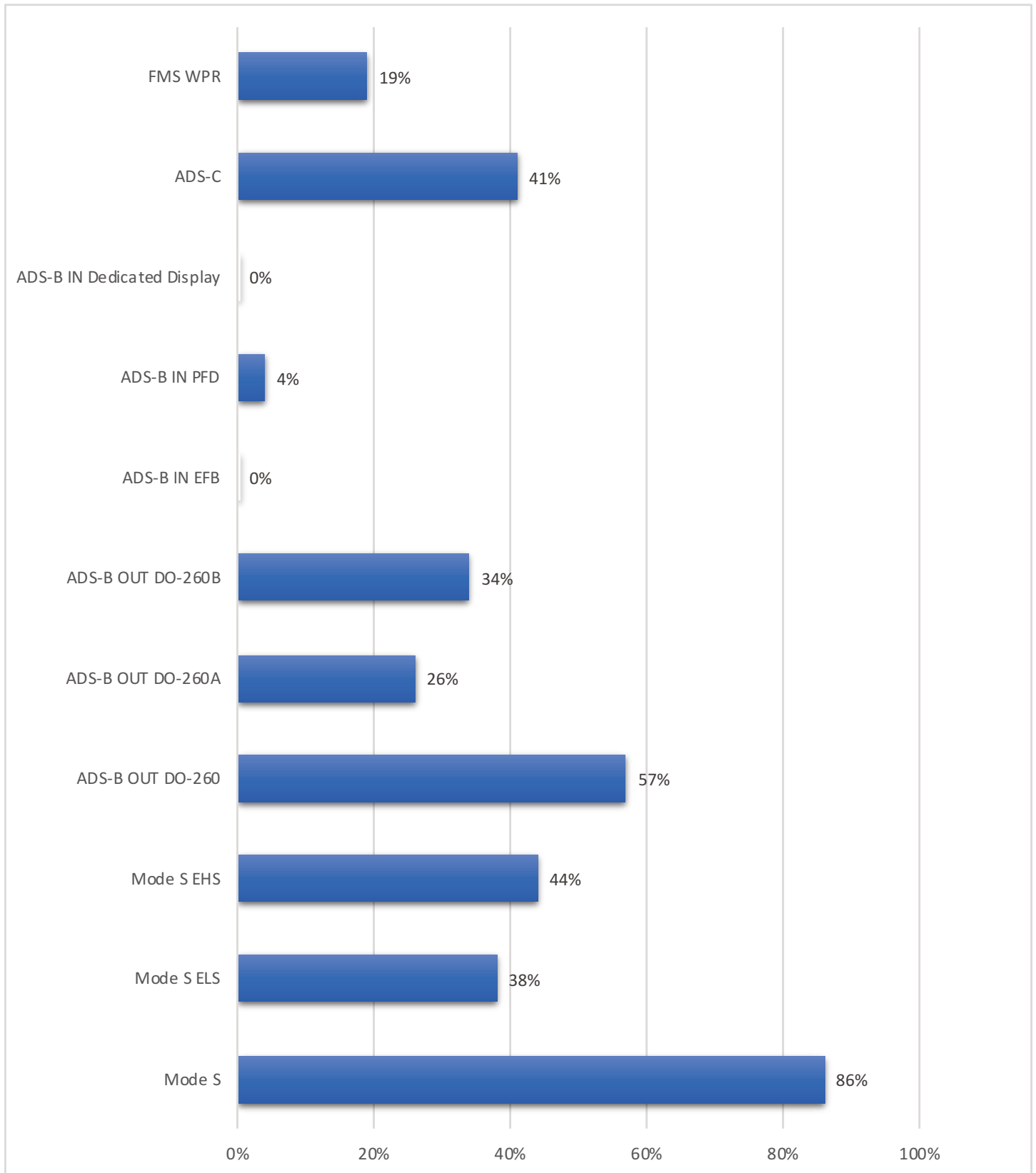
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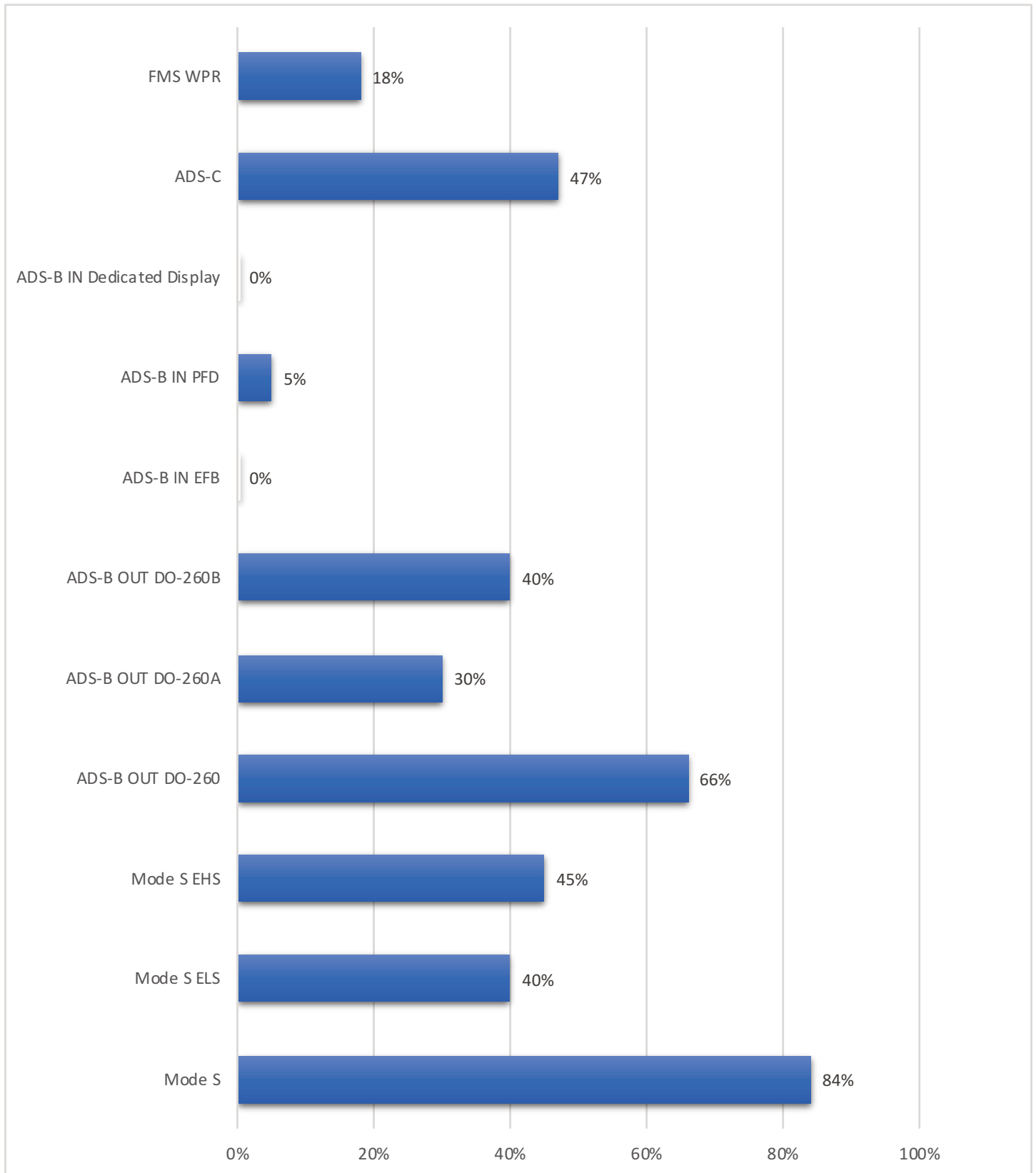


New York Oceanic

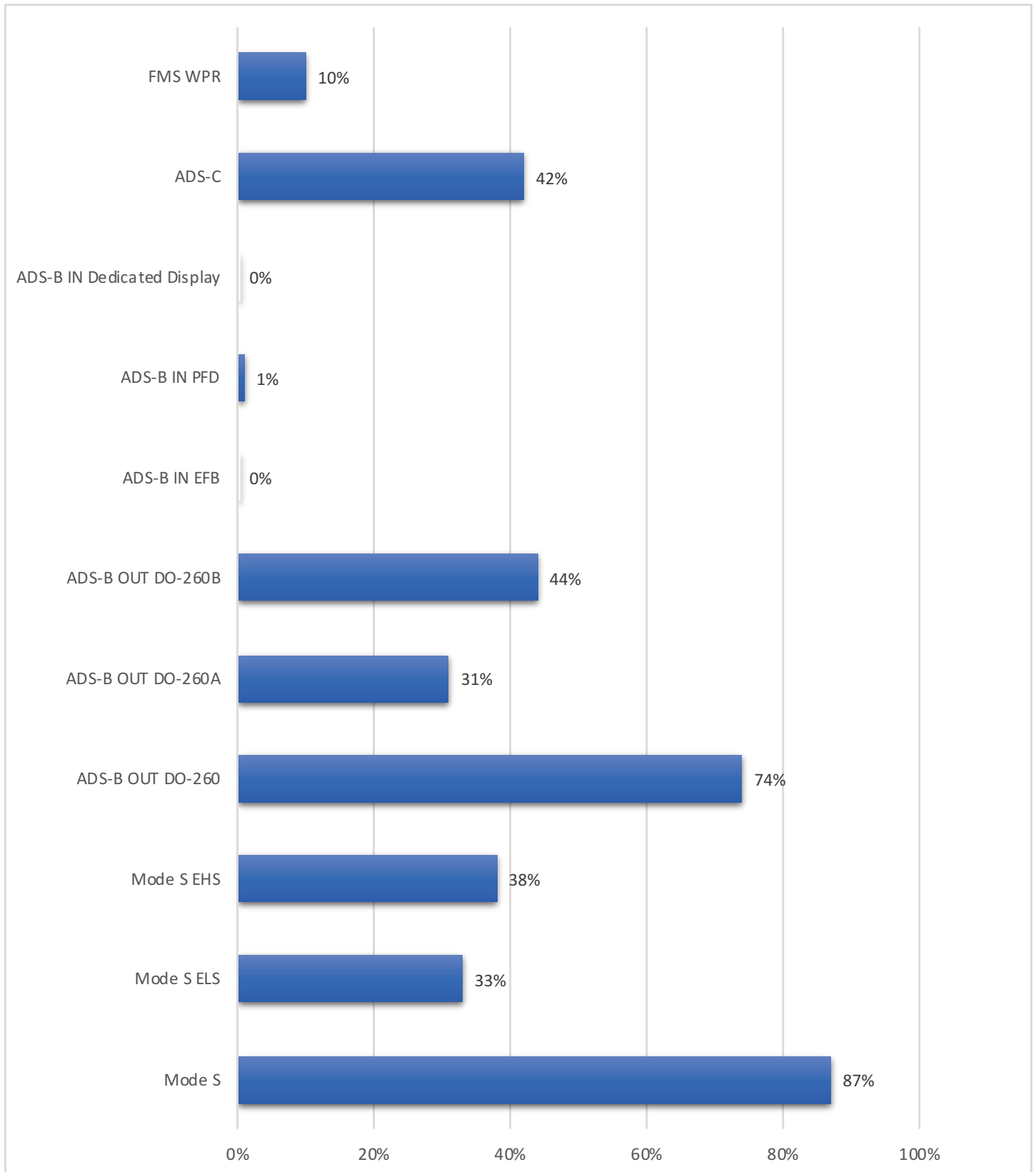


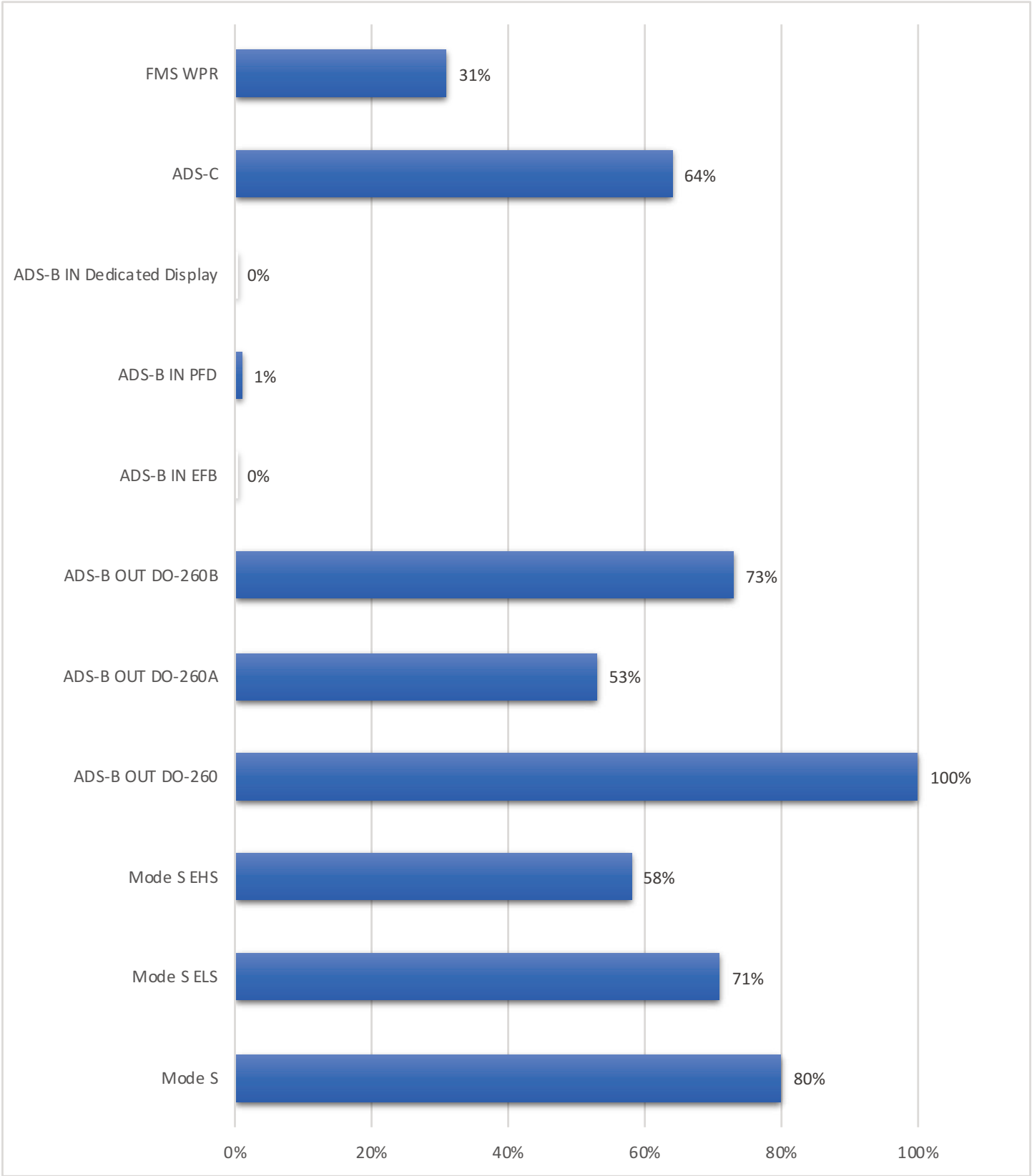
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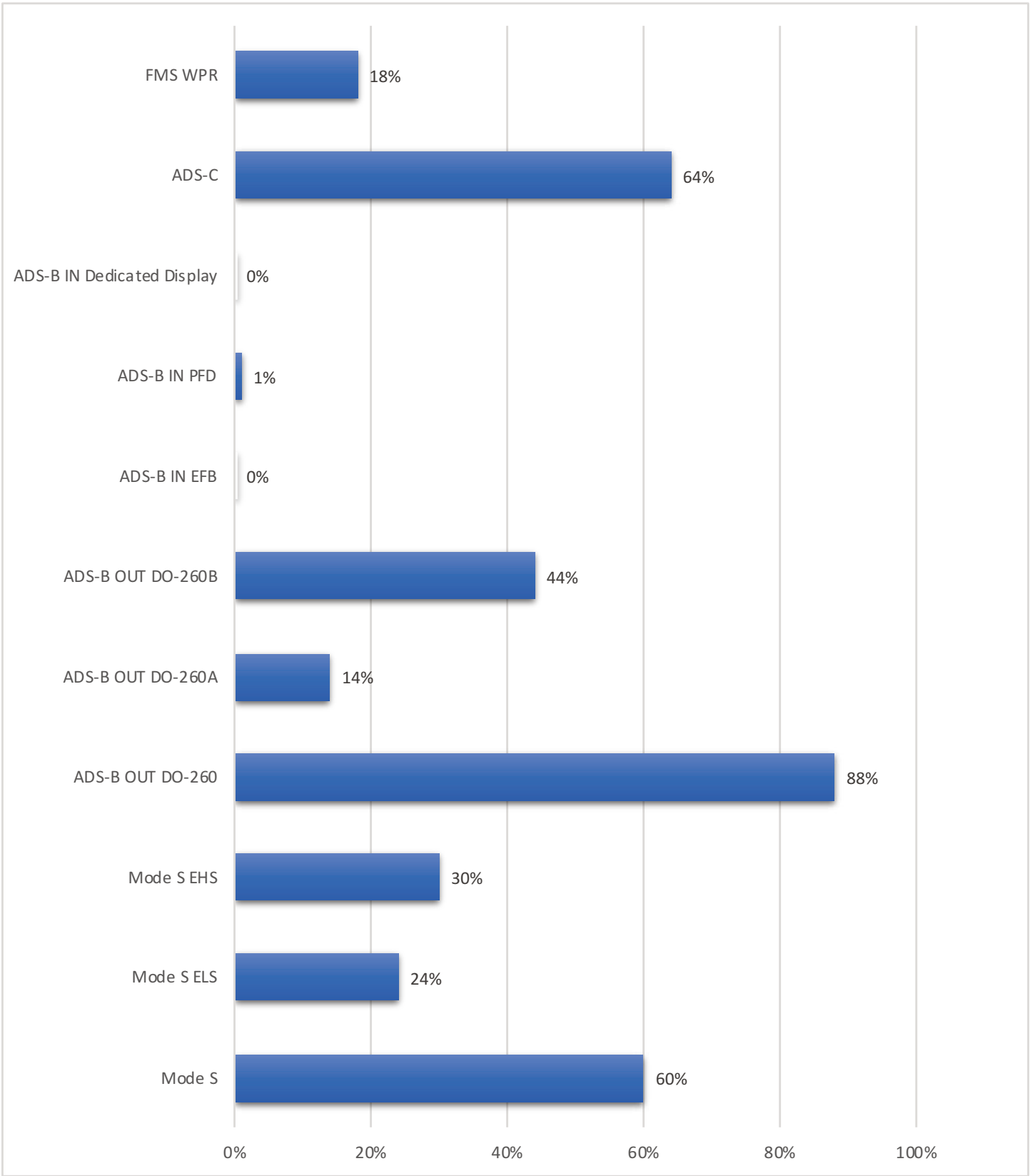




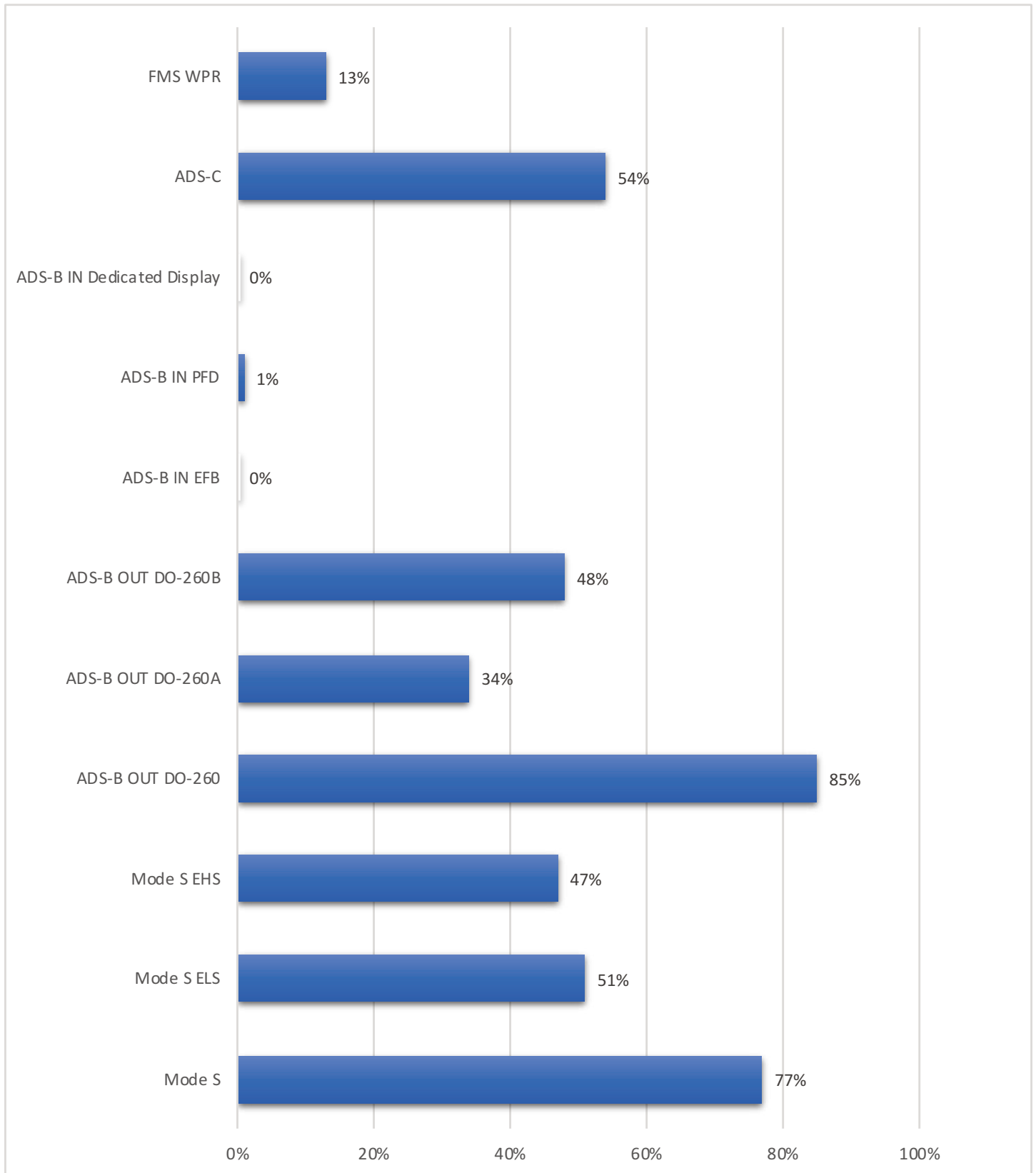
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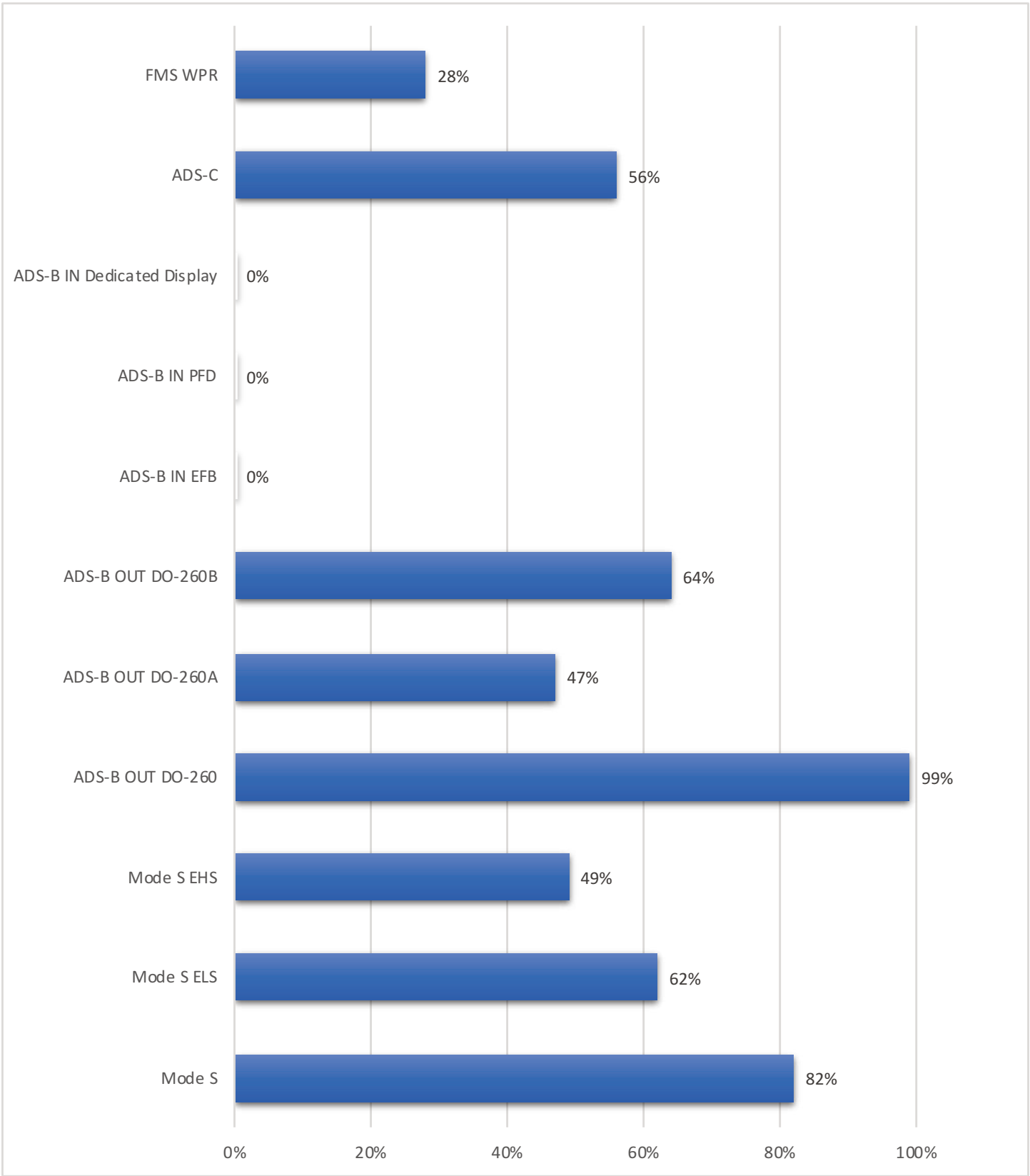


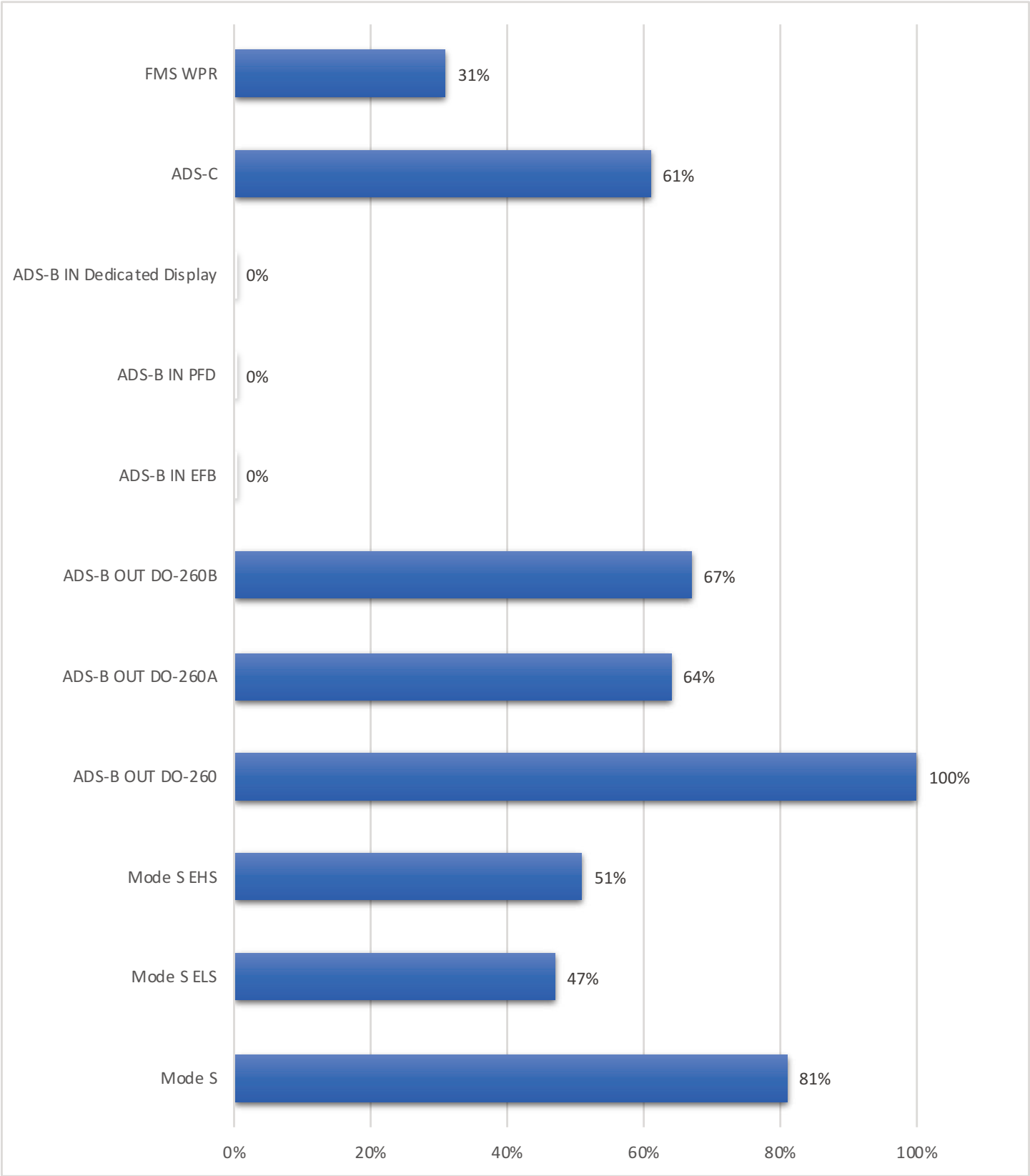


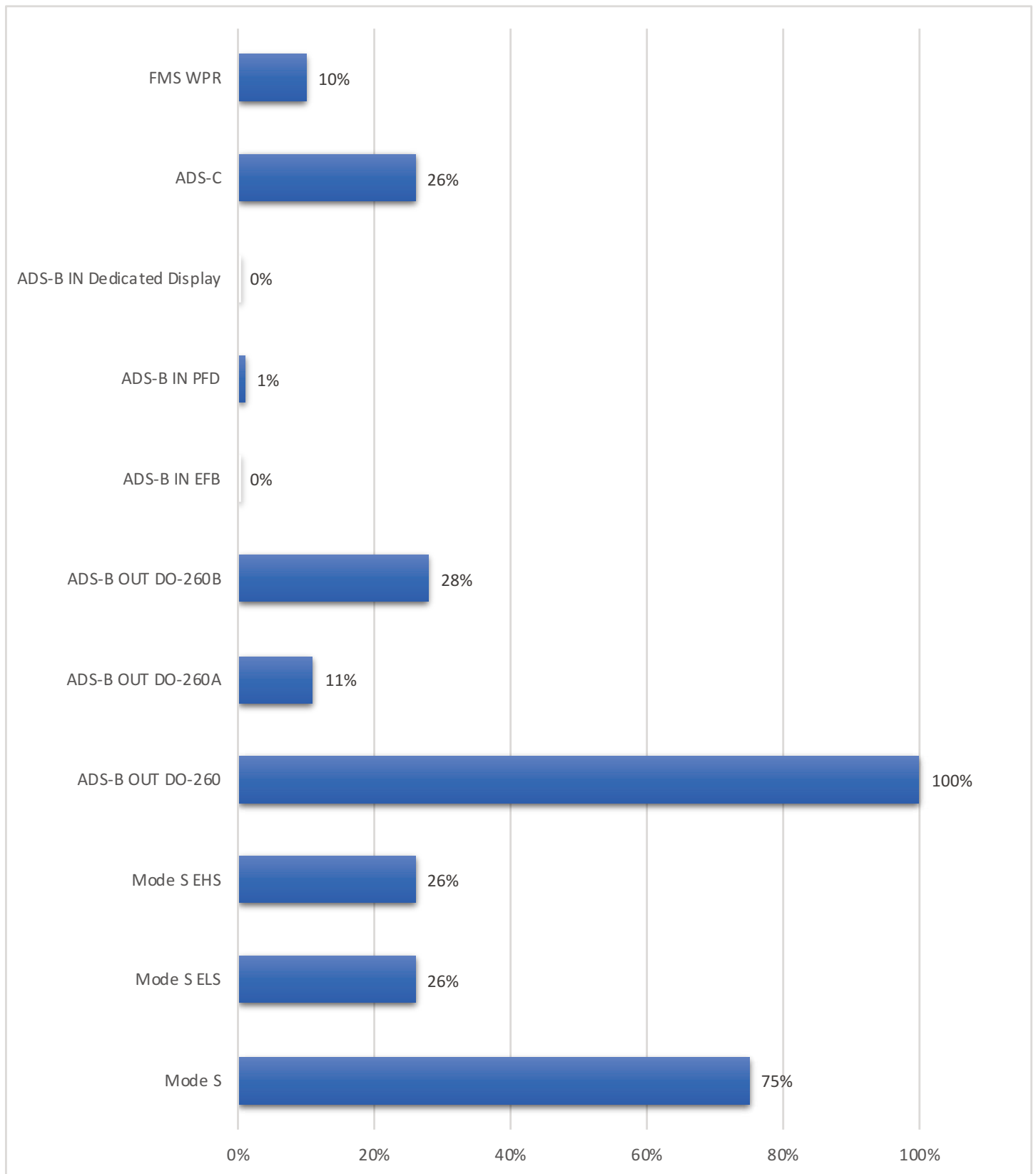


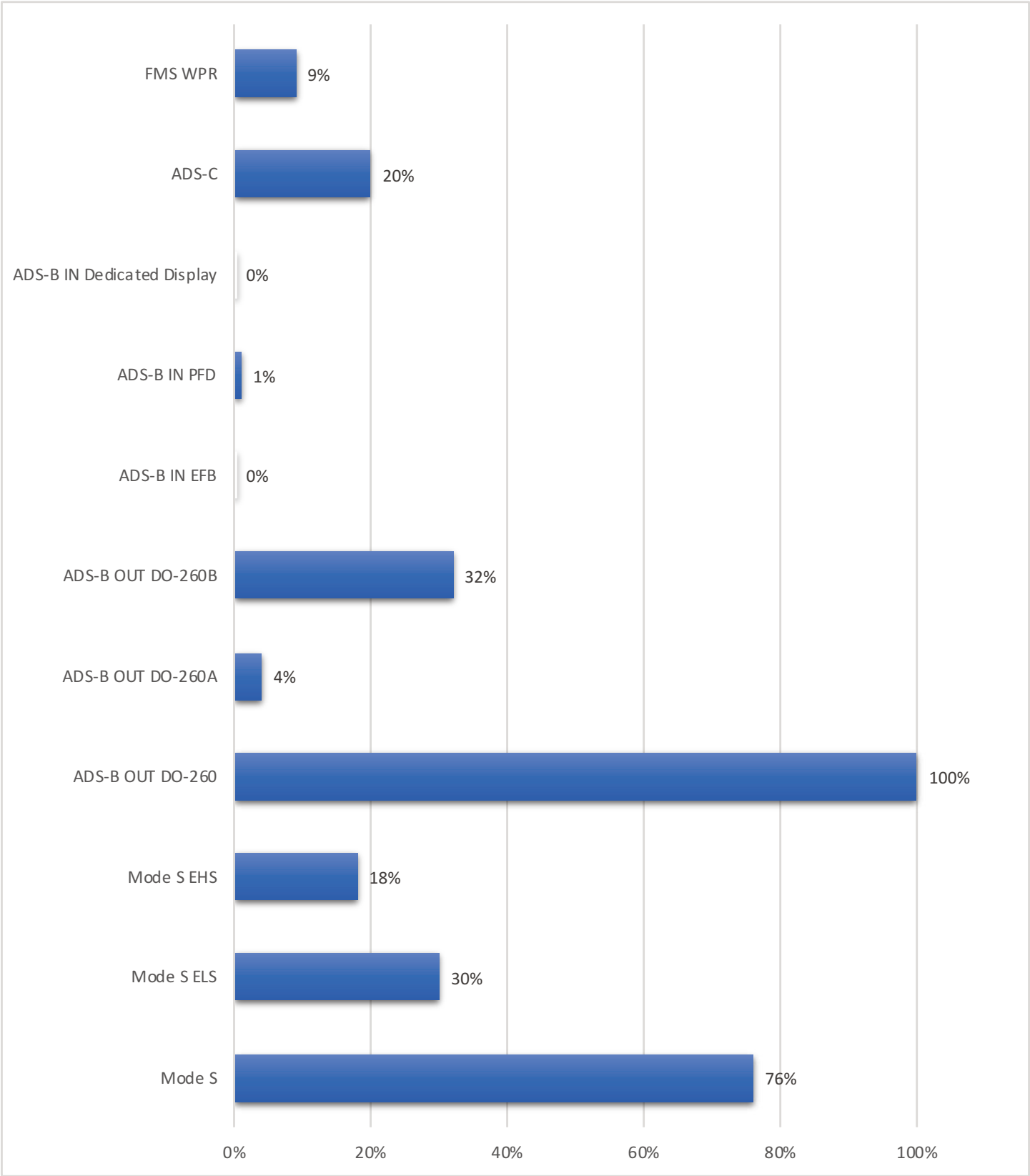
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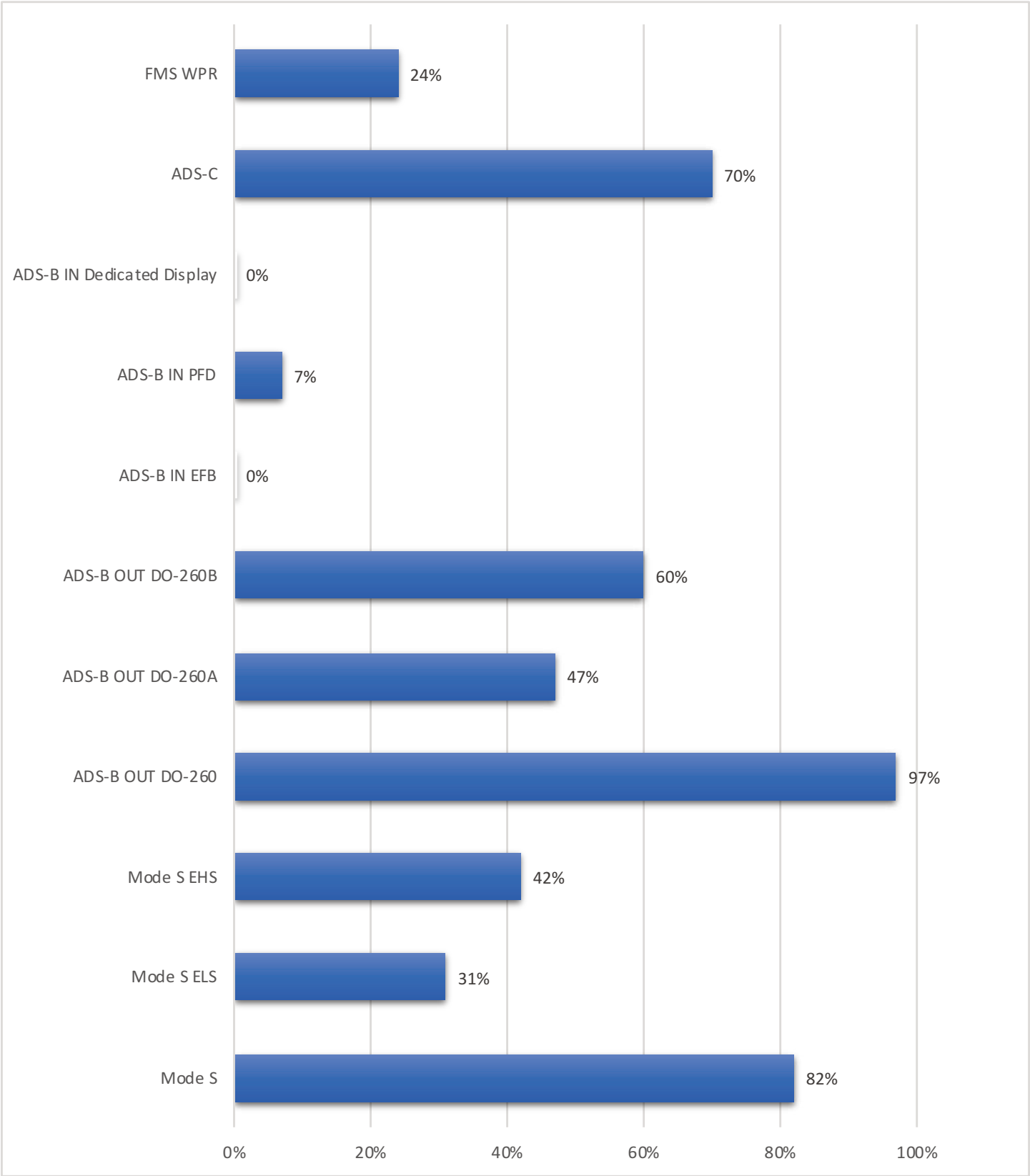


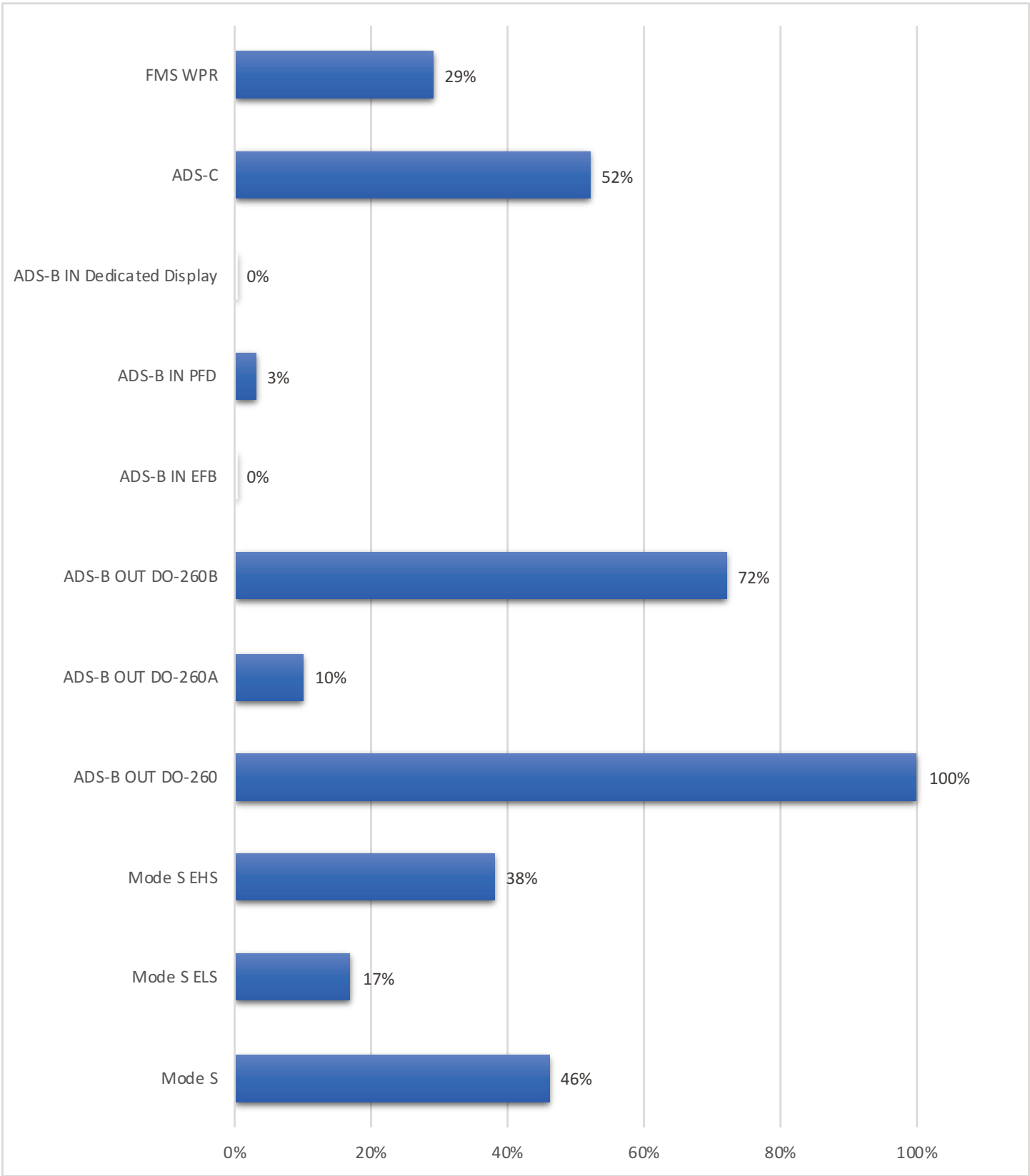


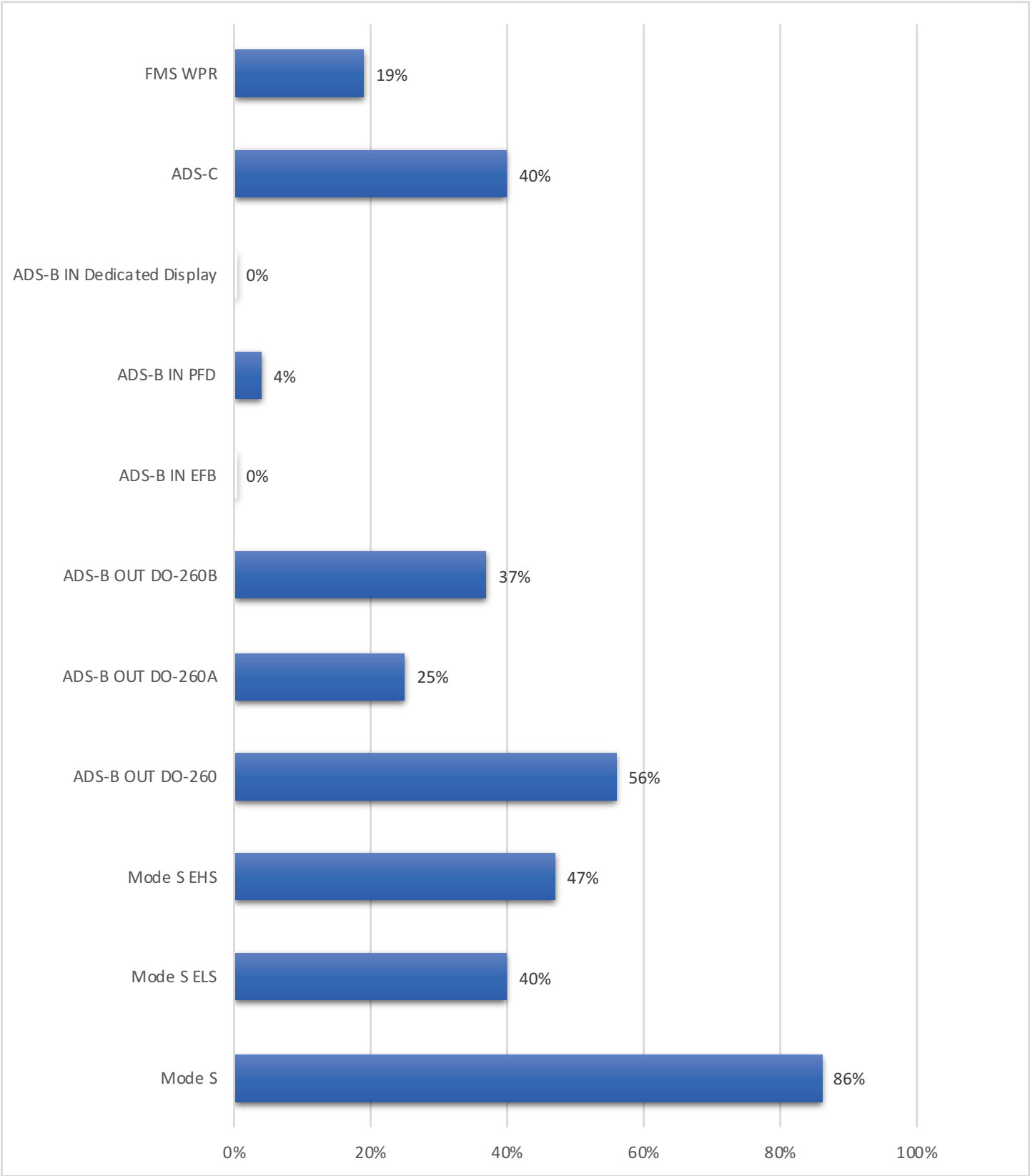


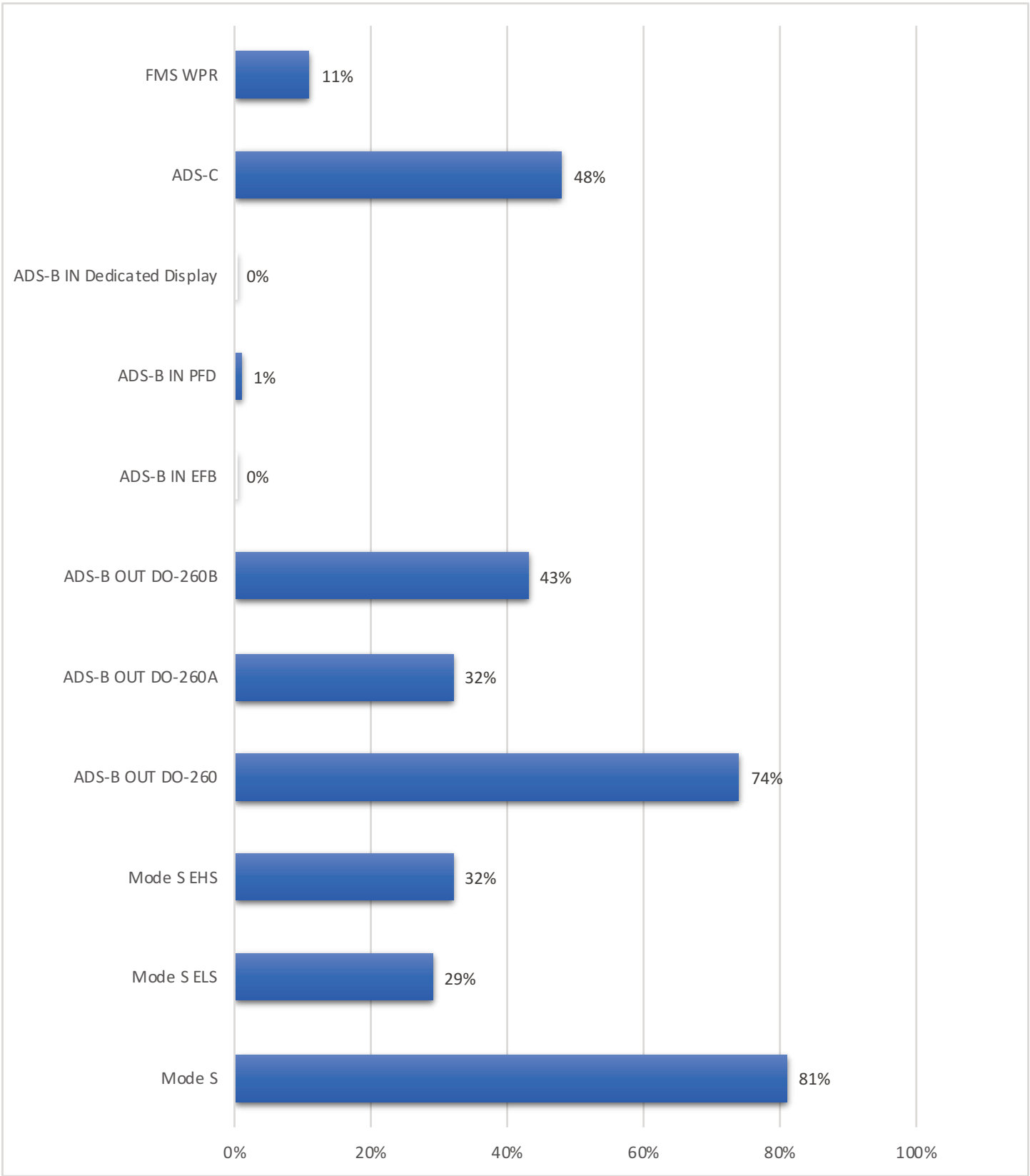


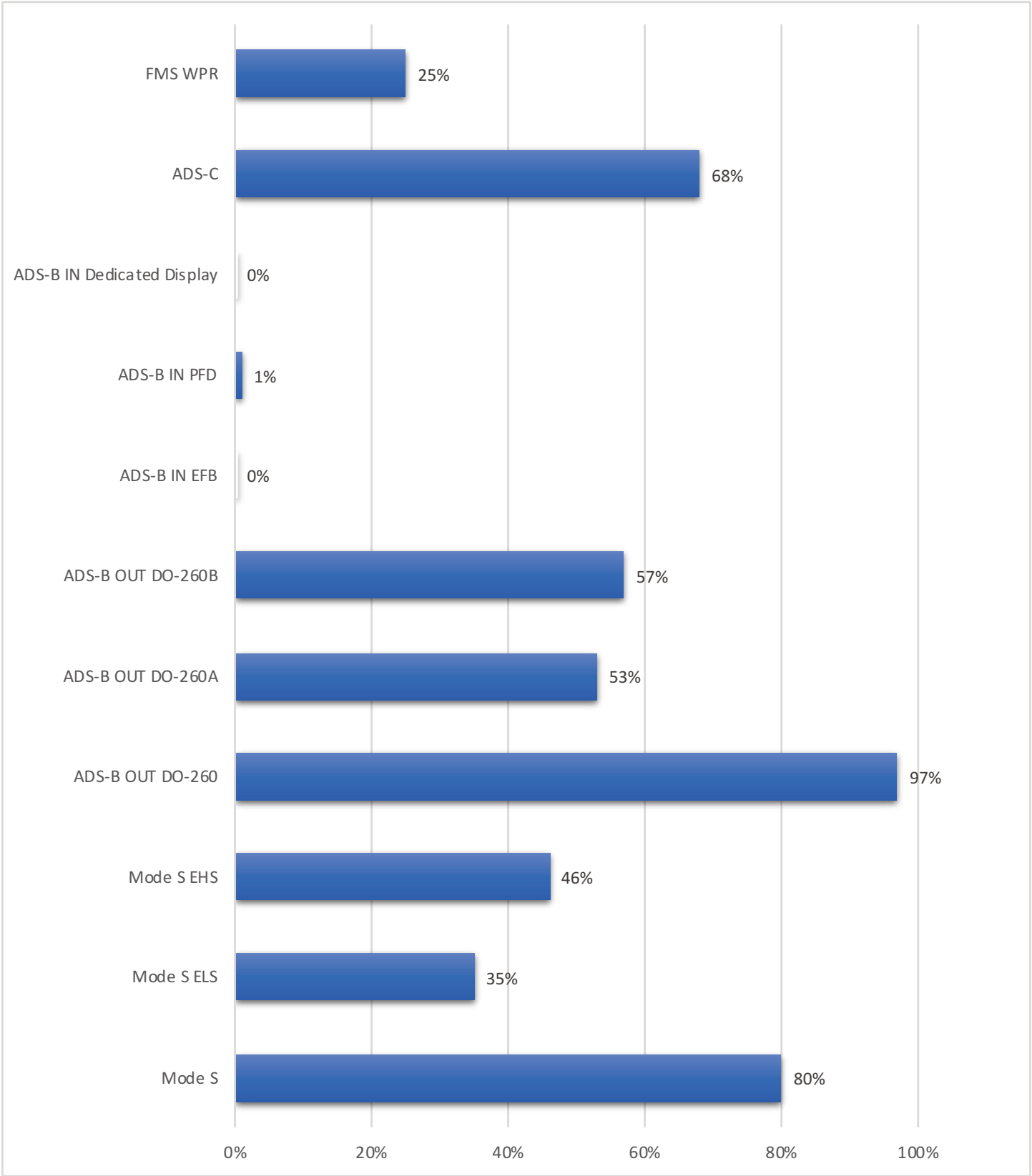


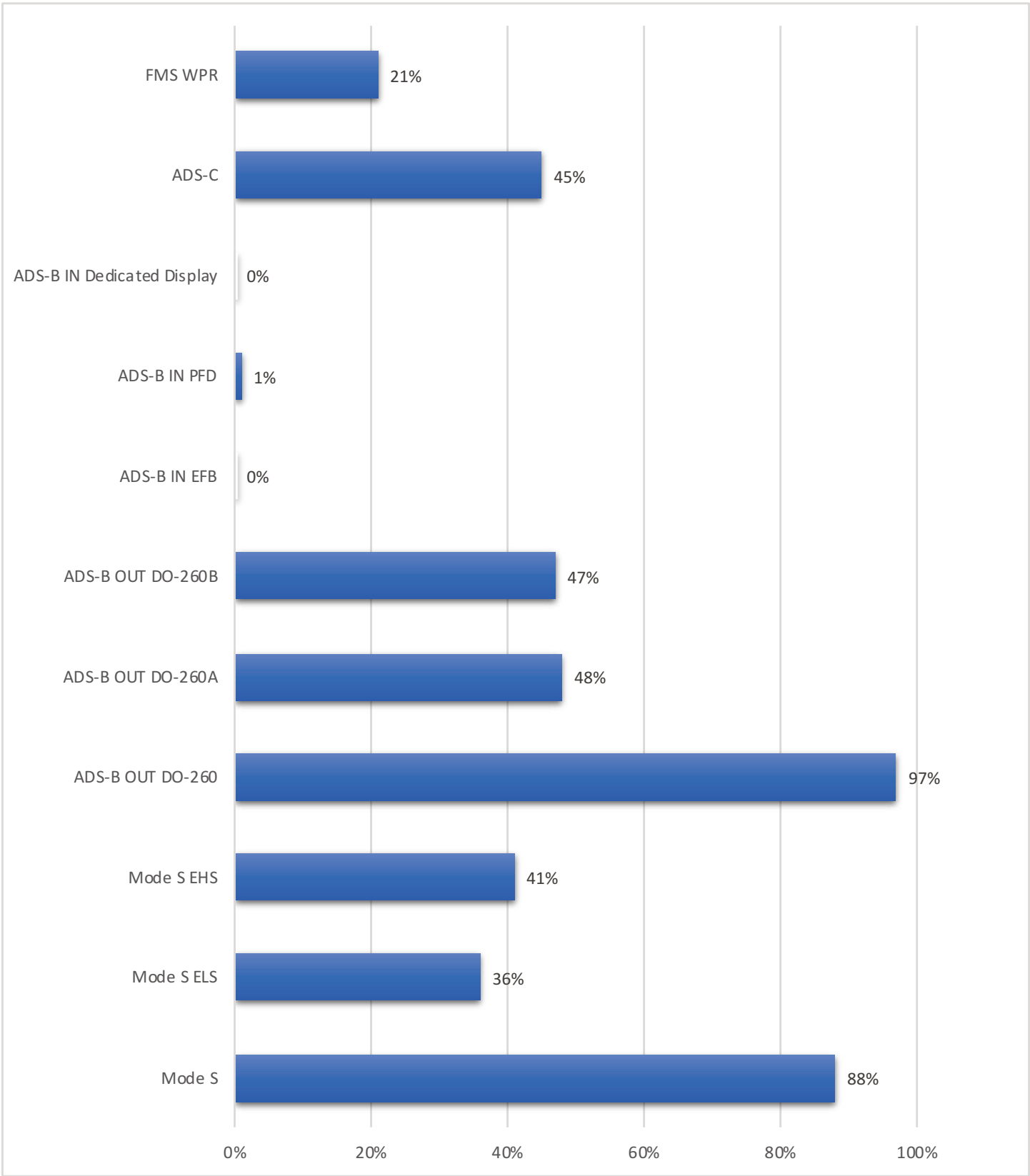


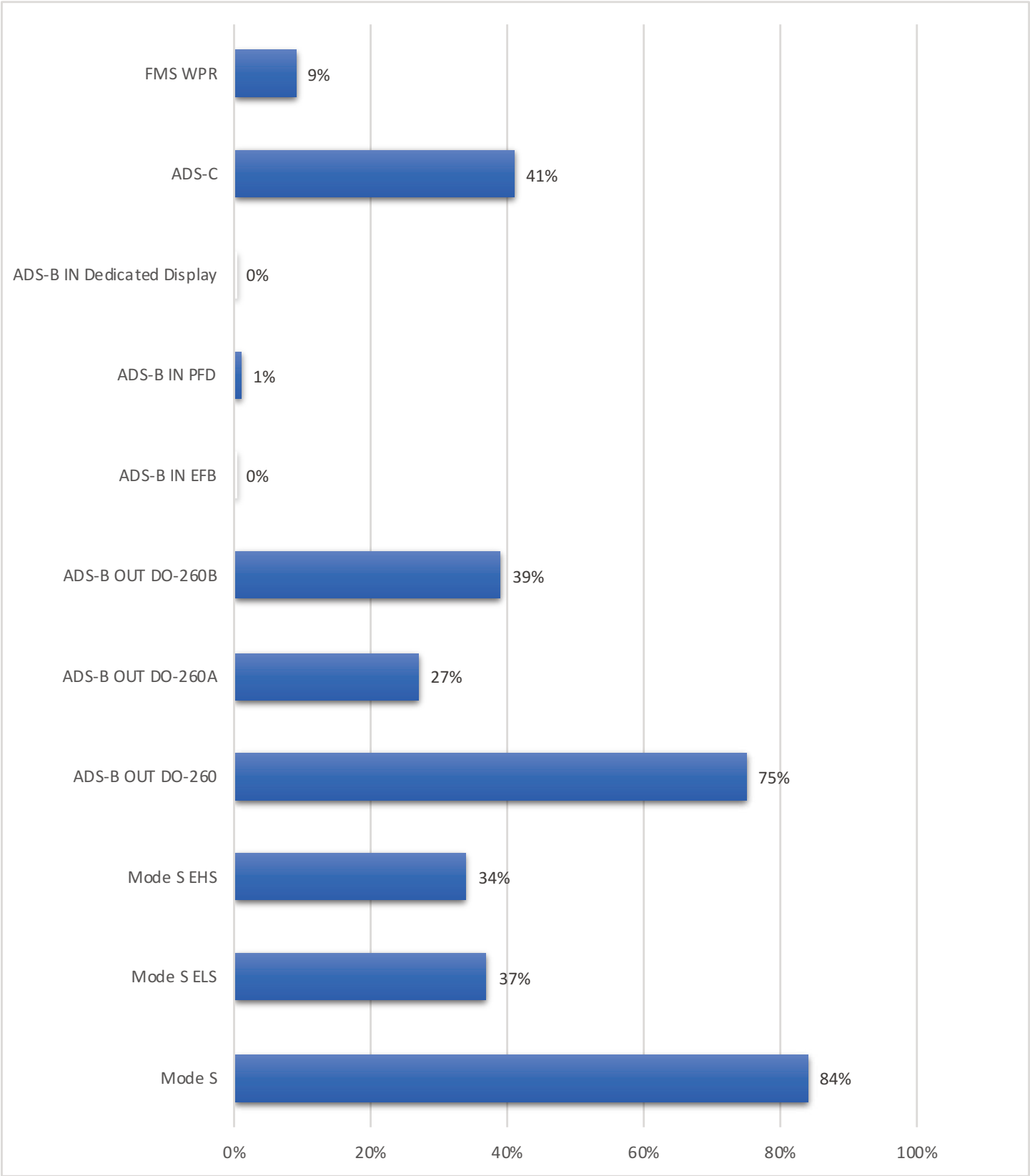


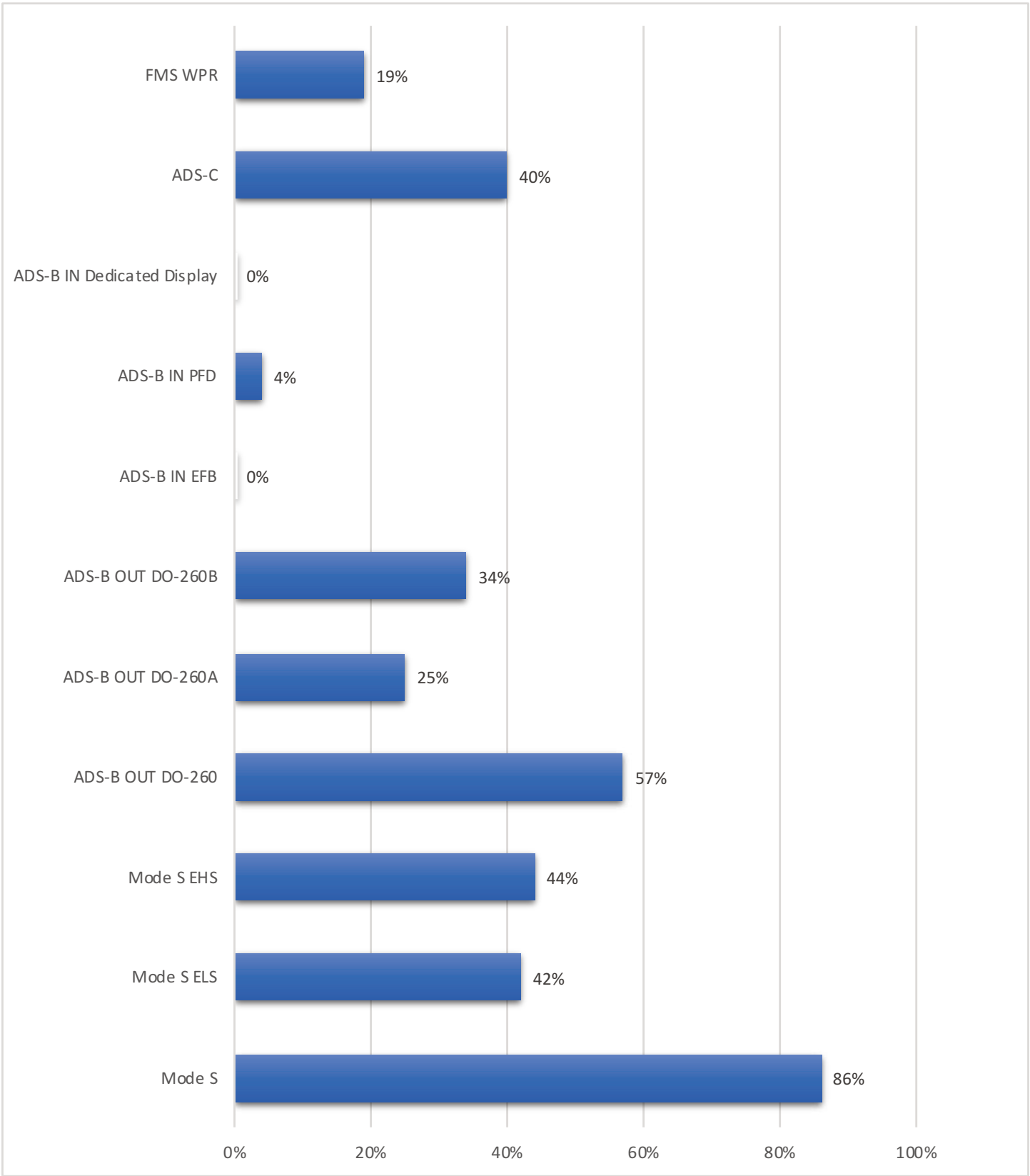


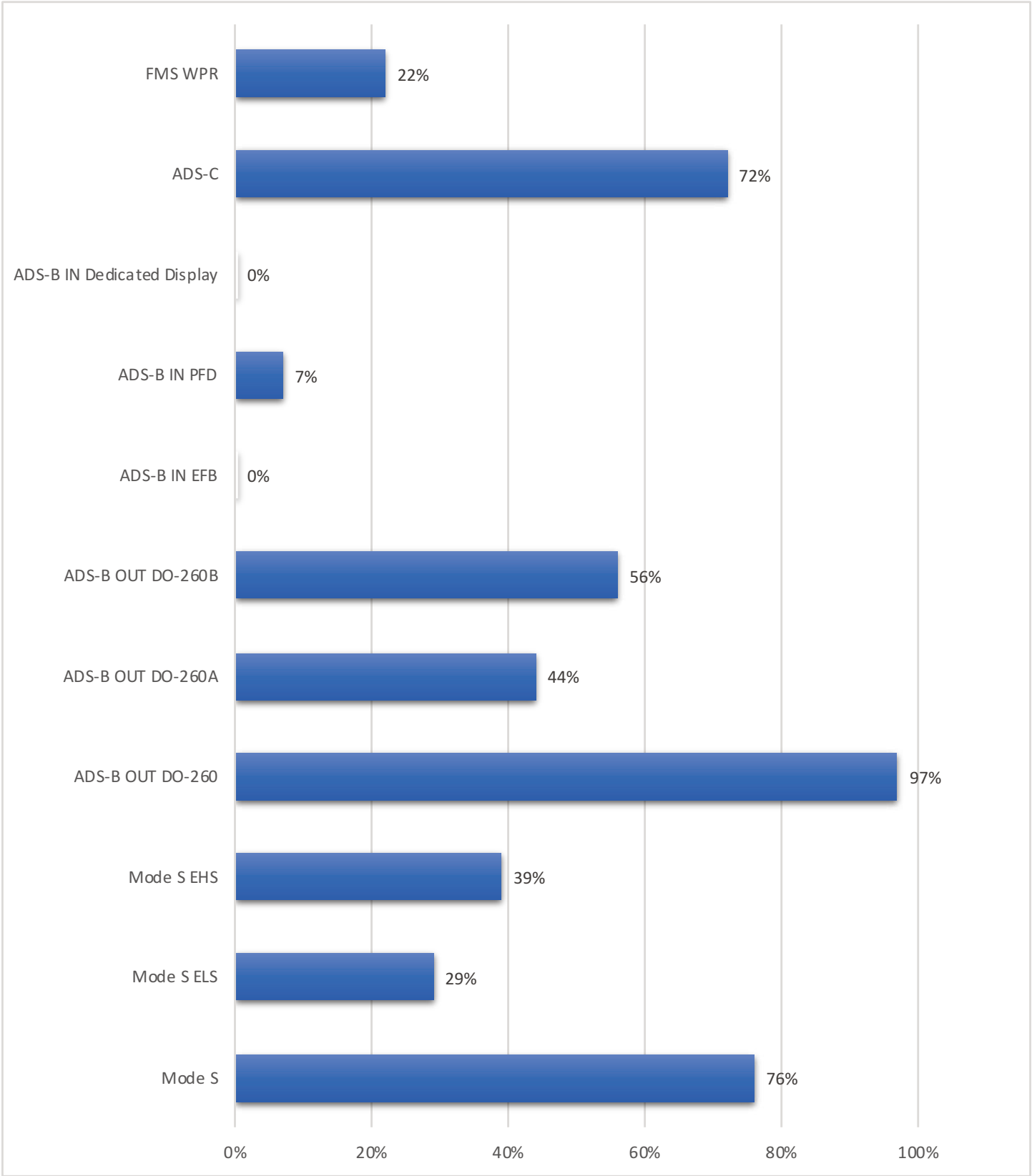


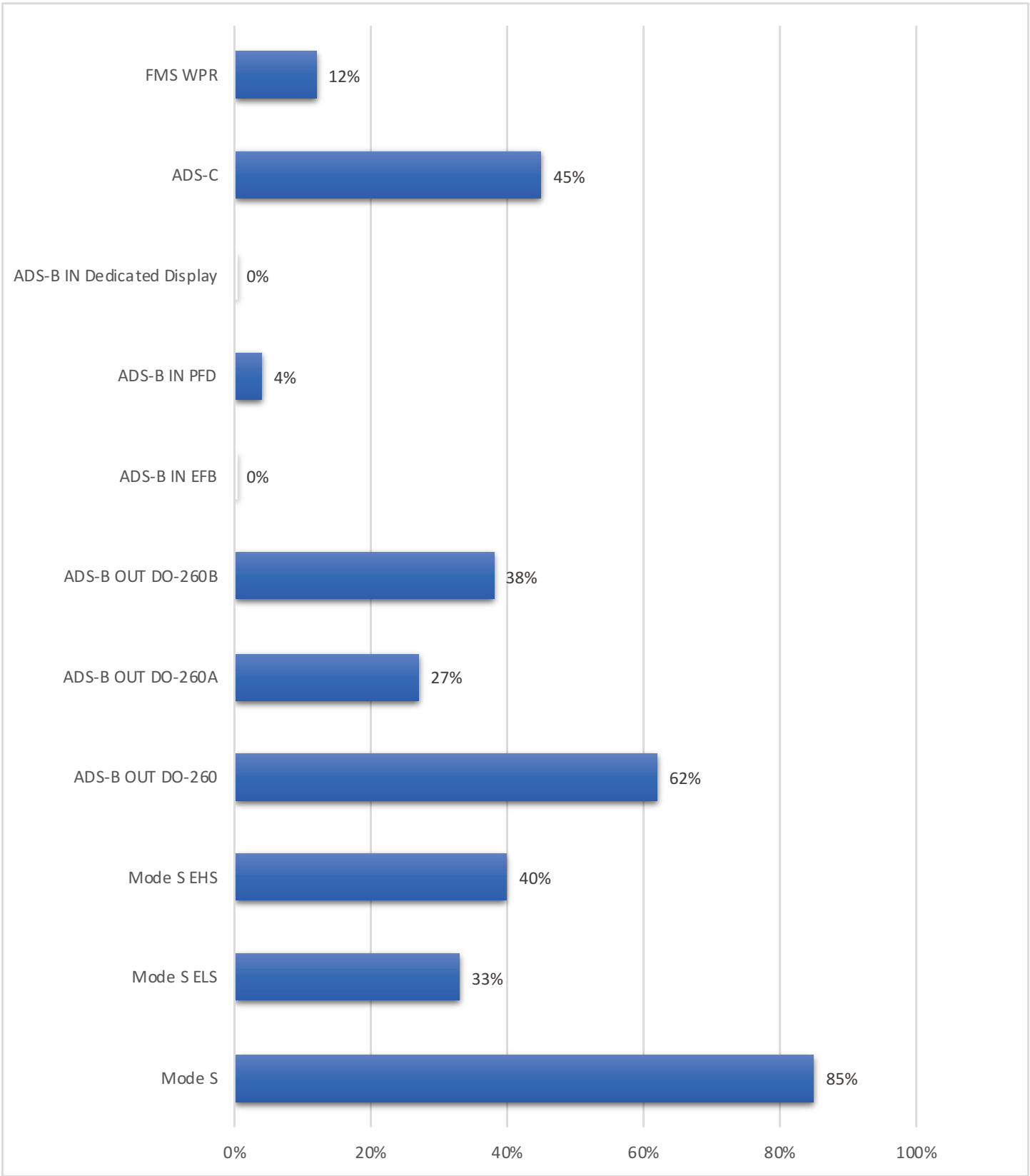




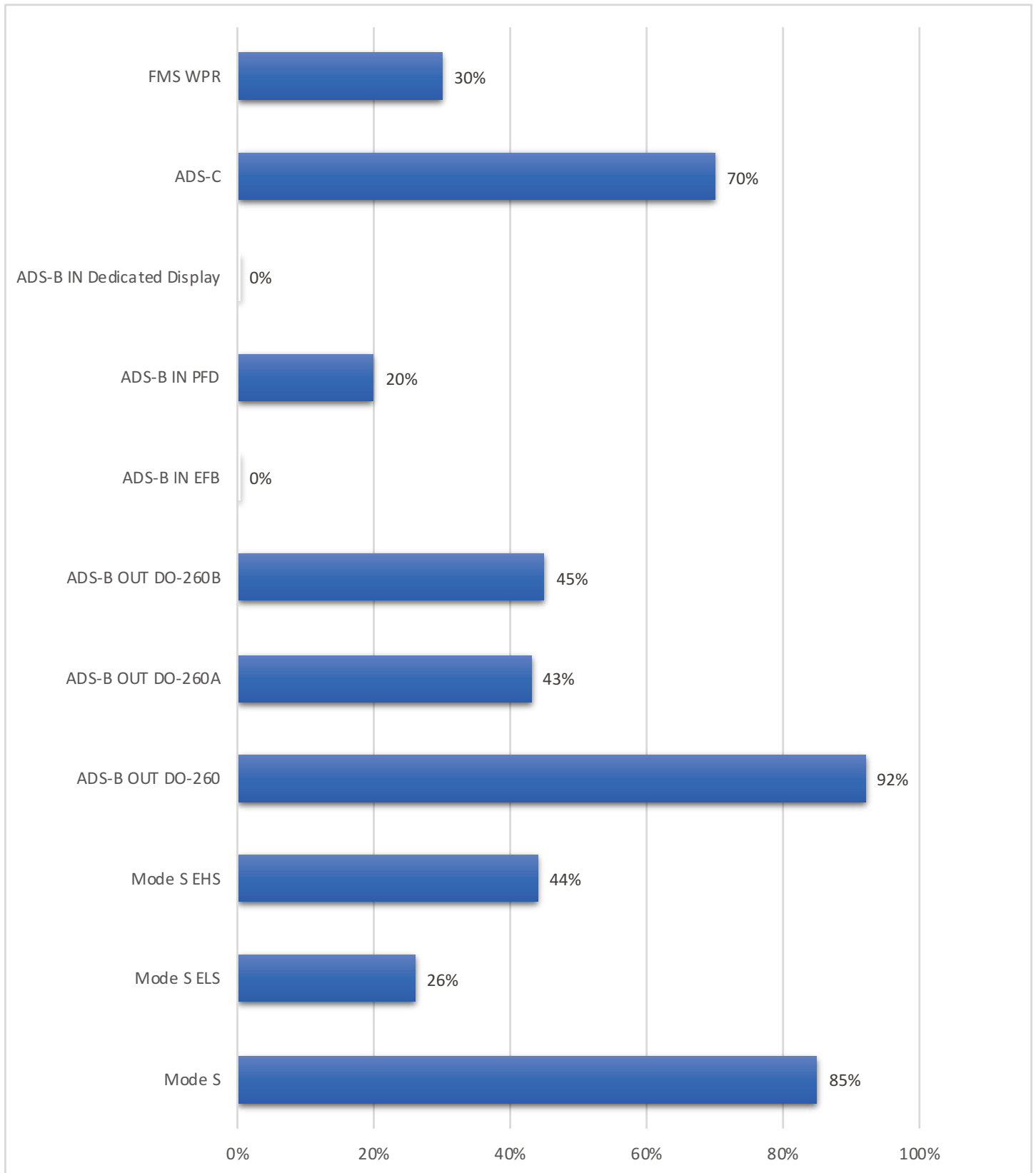


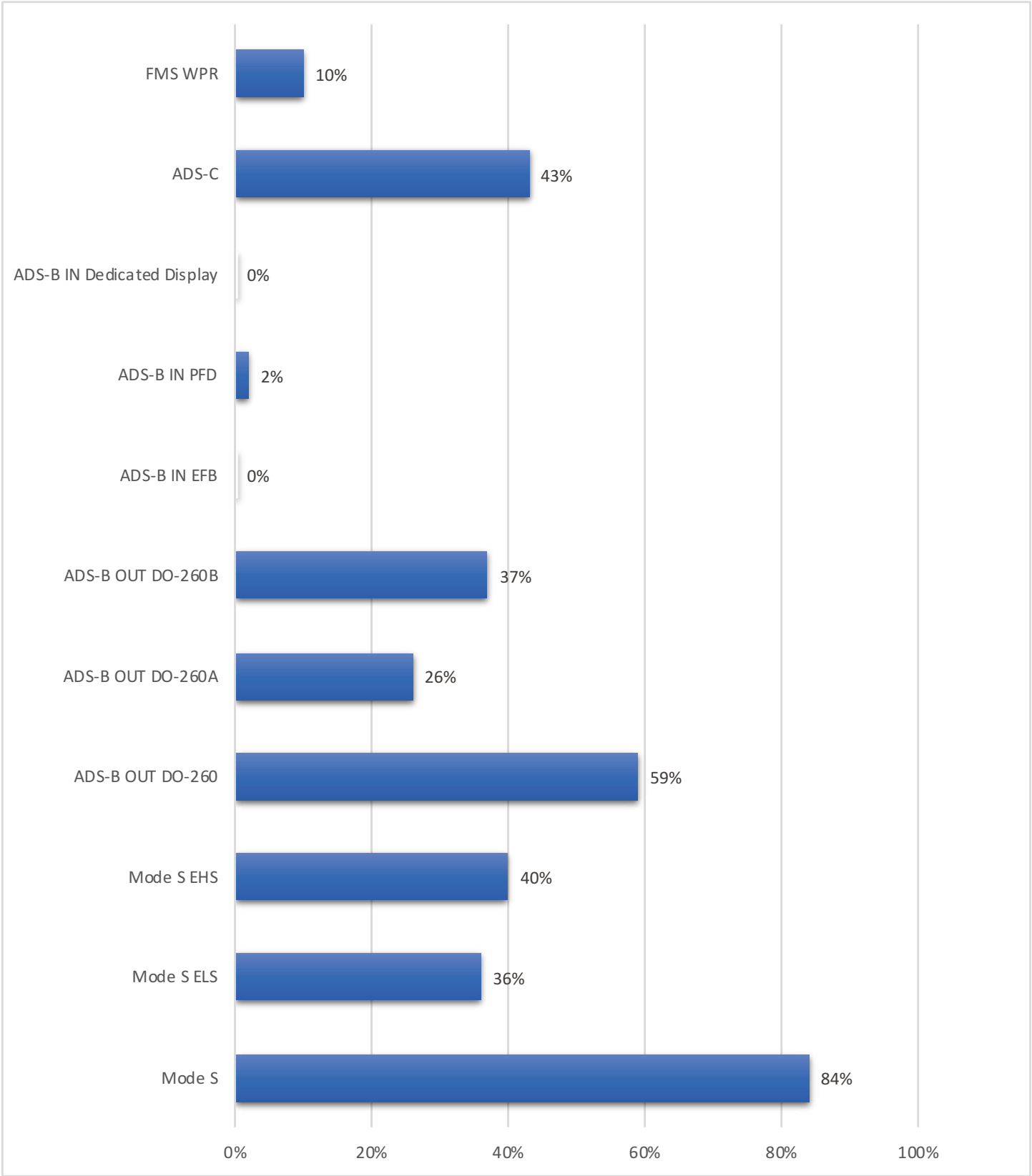


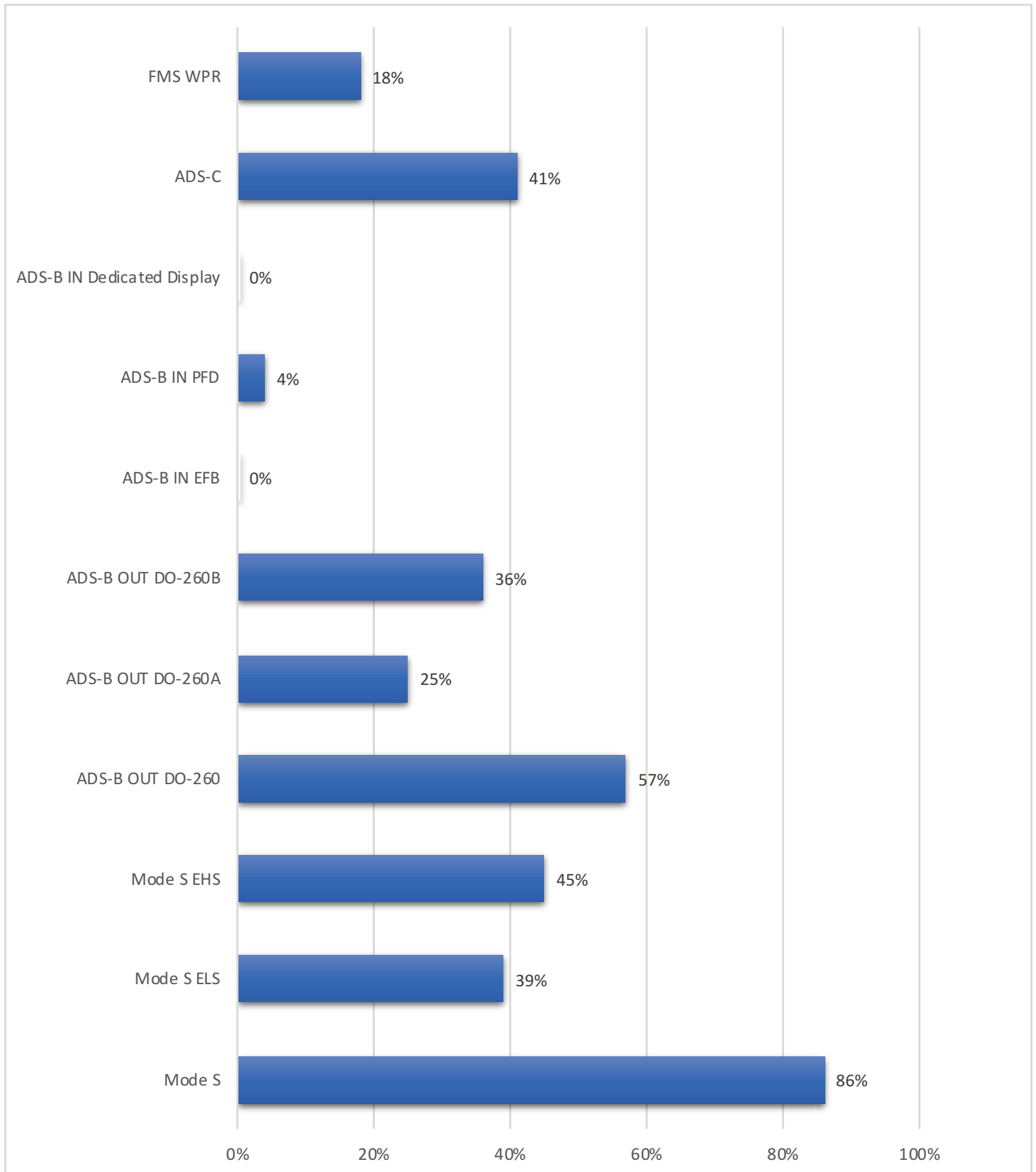


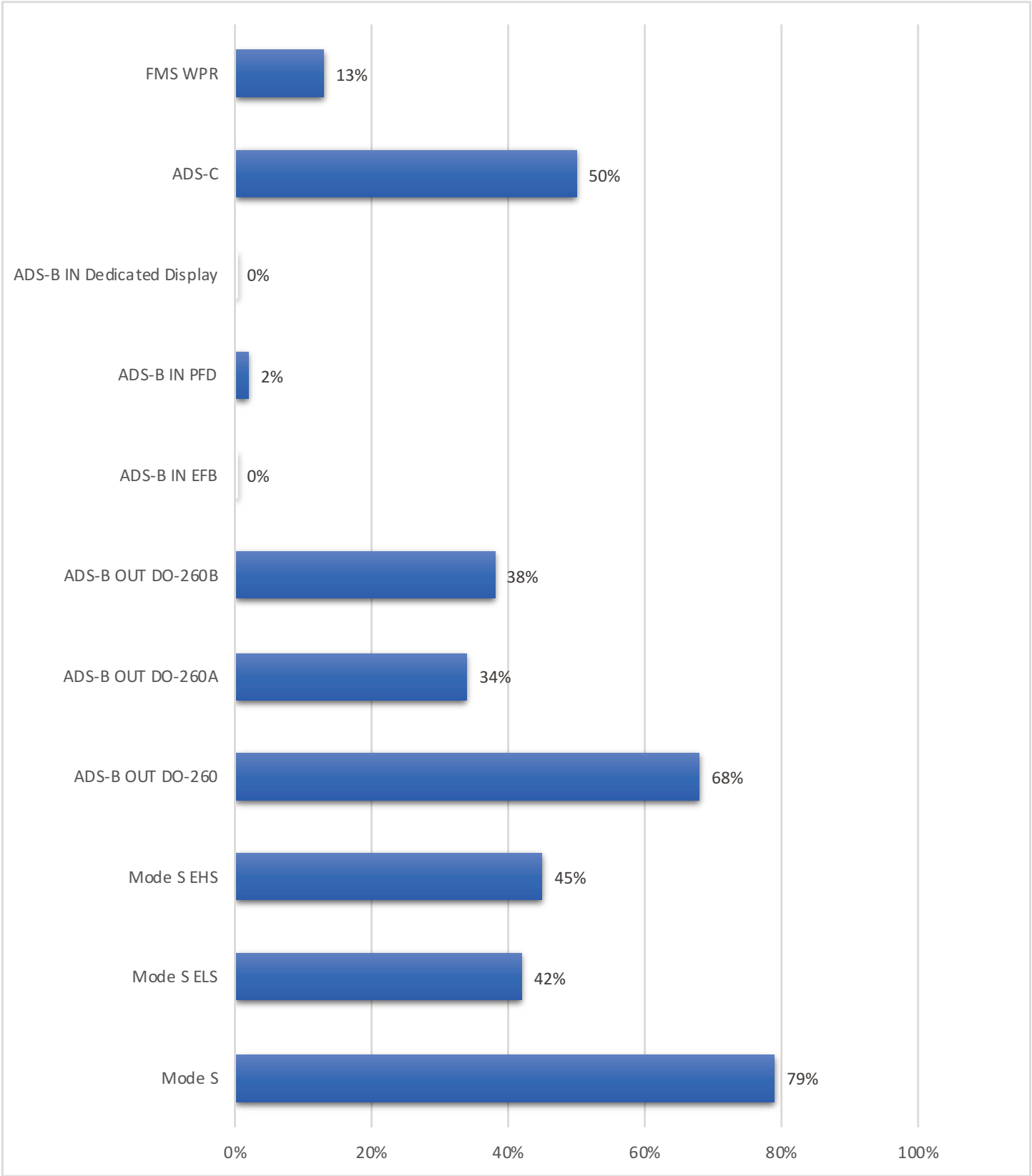


Trans-Polar (North and/or South)









Work In Progress

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The associated survey is located here...

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