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EUROLAS Data Center - Status Report 2018-2022

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Introduction

The EUROLAS Data Center (EDC) is one of two global data and operation centers of the International Laser Ranging Service (ILRS). Since 1991, the EDC has been archiving SLR data and products. They are available on FTP for the ILRS community. In this poster, a status report of the EDC over the period between 2018 and October 2022 is given. In detail, statistics of the EDC data holding (full-rate, normal point, predictions, products) are shown.

Full-Rate Data (CRDv1)

Full-rate data are the basis for the estimation of Normal Points which are used by the analysis centers for the computation of products. In the period between Jan. 2018 and Oct. 2022, 35 stations delivered full-rate data for 145 satellites. Figure 1 shows the number of observations for each satellite, station and year.
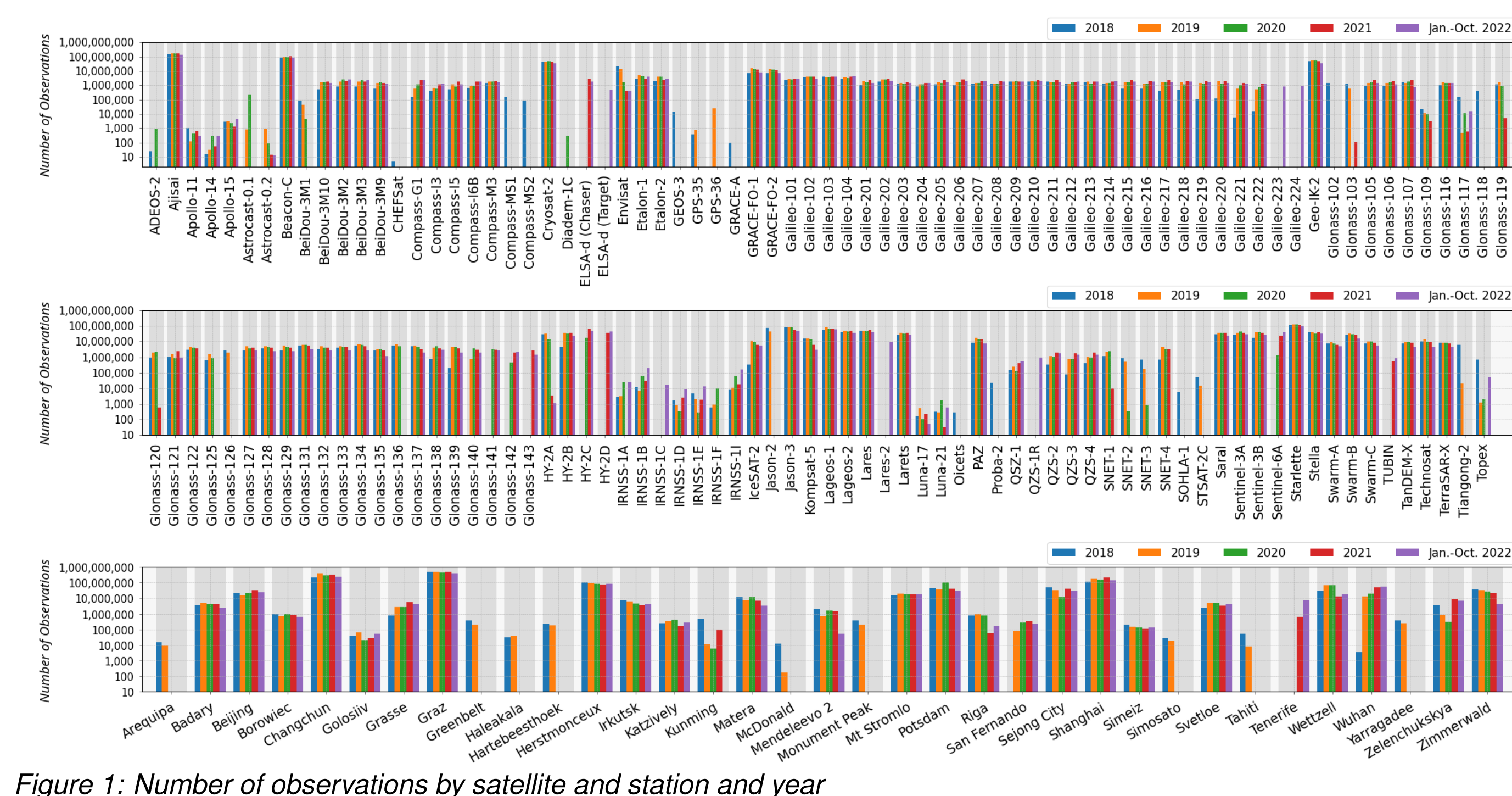

Figure 1: Number of observations by satellite and station and year

Compared to previous years, the number of monthly observations from full-rate data increases slightly. The average of monthly observations varies between 97,605,336 (2018), 115,545,503 (2019), 108,466,177 (2020), 112,440,582 (2021) and 119,297,155 (2022). Figure 2 shows the development of the monthly observations.
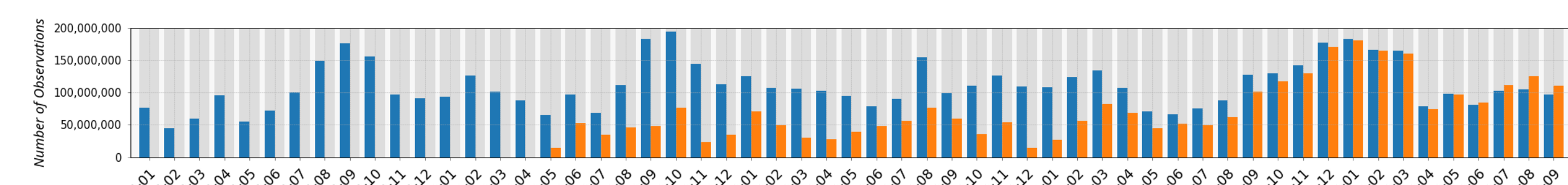

Figure 2: Monthly number of observations (FRDv1: blue, FRDv2: orange)

Normal Points Data (CRDv1)

Normal Point data are used by the analysis centers for the computation of products. In the period between Jan. 2018 and Oct. 2020, 40 stations delivered normal points for 138 satellites. Figure 3 shows the number of normal points for each satellite, station and year.
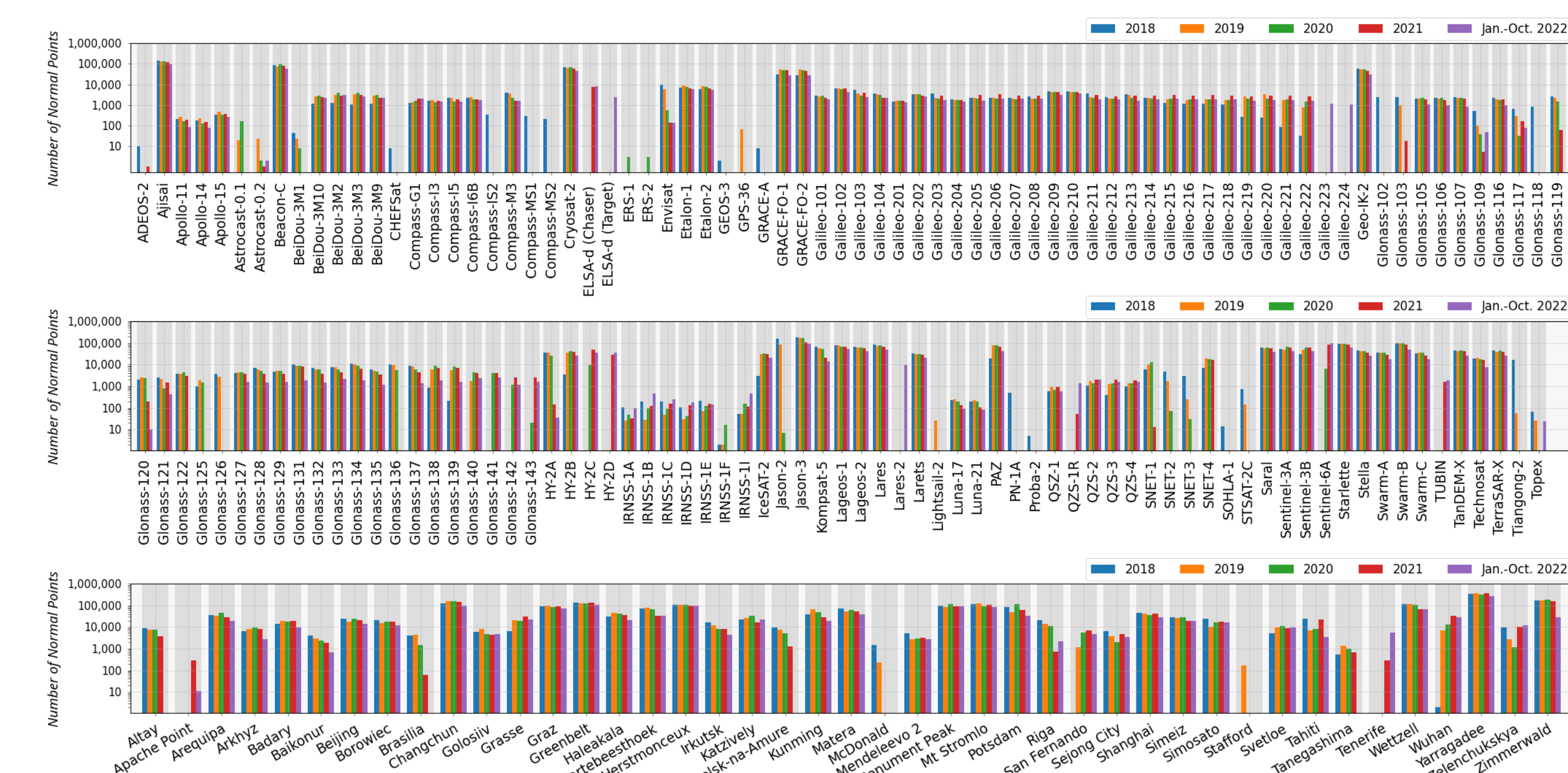

Figure 3: Number of normal points by satellite and station and year

Since January 2018, the number of monthly normal points has varied strongly between 108,473 (Jan. 2020) and 205,549 (Sep. 2019). However, the average of monthly normal points increased slightly between 81,535 (2018), 86,063 (2019), 100,891 (2020), 105,404 (2021) and 133,501 (2022). Figure 4 shows the development of the monthly normal points.
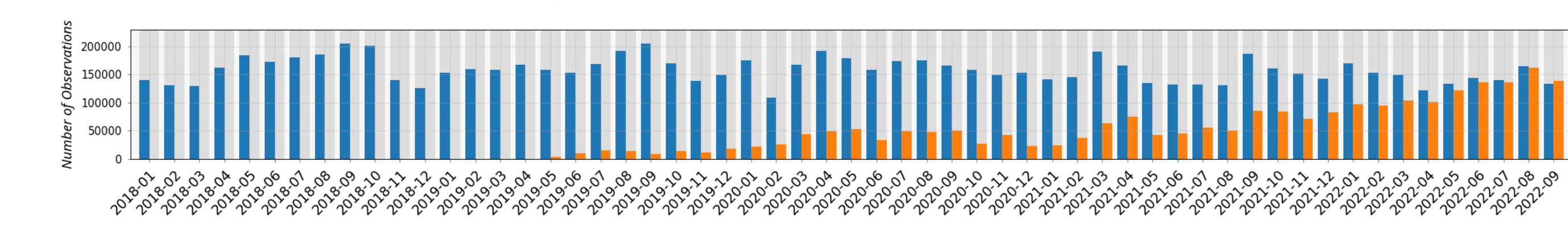

Figure 4: Monthly number of normal points (NPTv1: blue, NPTv2: orange)

Predictions (CPFv1)

Satellite predictions are essential for the SLR tracking by the SLR stations. In the period between January 2018 and October 2022, predictions (CPF) of 134 satellites were computed by 29 providers. Figure 5 shows the number of available predictions for each satellite and year.
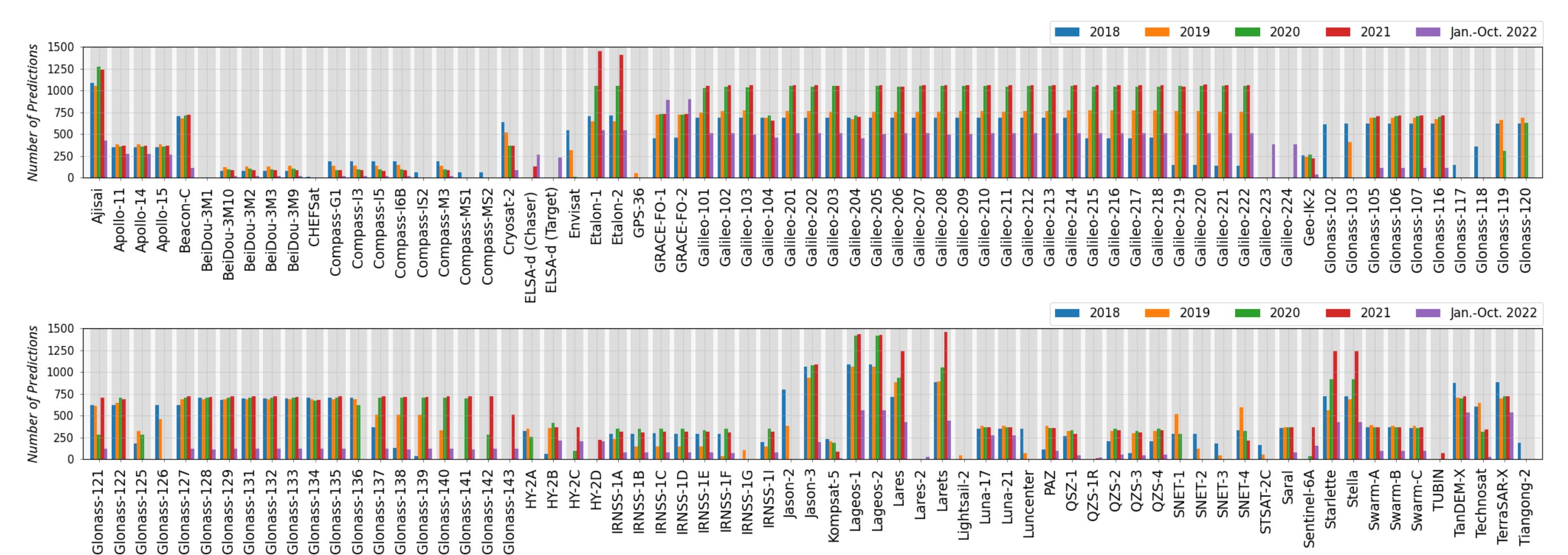

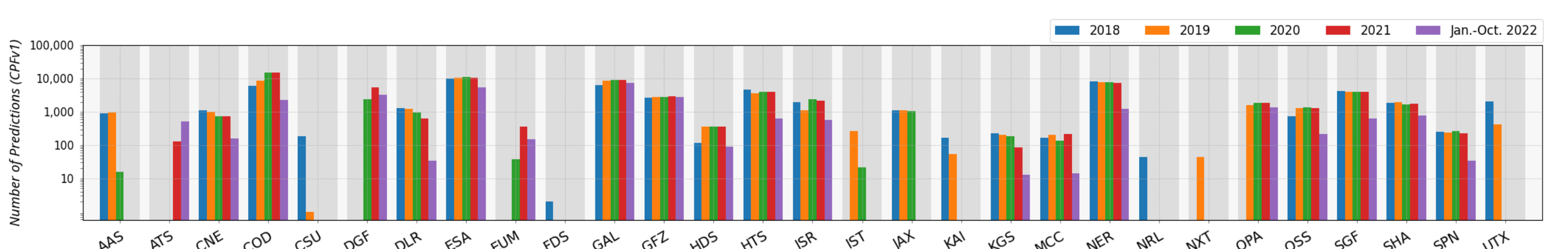Figure 5: Statistics of the number of predictions by satellite and year

Figure 6: Statistics of the number of predictions by provider and year

Since Jan. 2018, satellite predictions have been delivered by 29 providers. The most active providers were CODE (1017 CPF per month), ESA (944) and GAL (734).
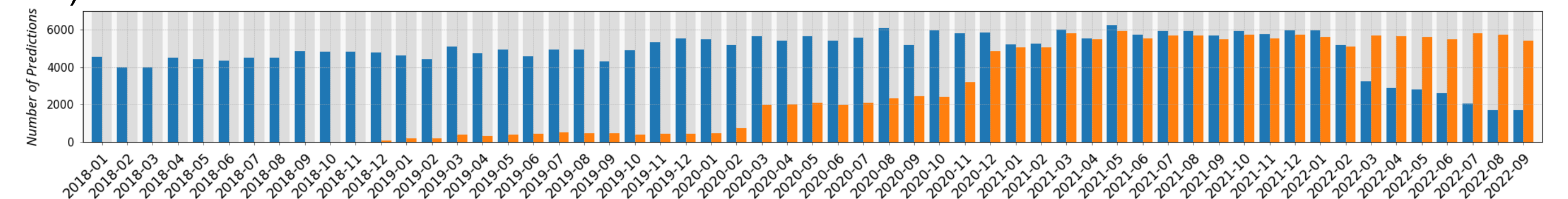

Figure 7: Statistics of monthly number of predictions (CPFv1: blue, CPFv2: orange)

Over the last years, the number of daily predictions has increased (2018: 148 per day, 2019: 171, 2020: 256, 2021: 371, 2022: n.a.). Figure 7 shows the development of the monthly number of predictions between January 2016 and August 2018.

ILRS Products

The ILRS analysis centers deliver station position, Earth orientation parameter and orbits (Lageos-1/-2, Etalon-1/-2, Ajisai, Lares, Larets, Starlette, Stella) to the EDC.

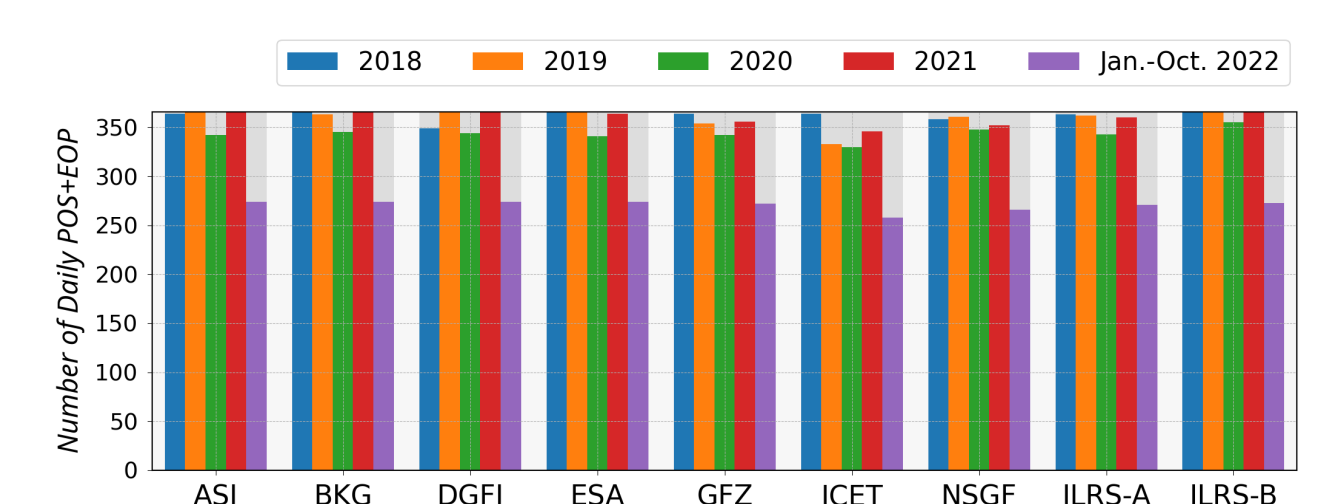All products are provided via FTP to the ILRS community.

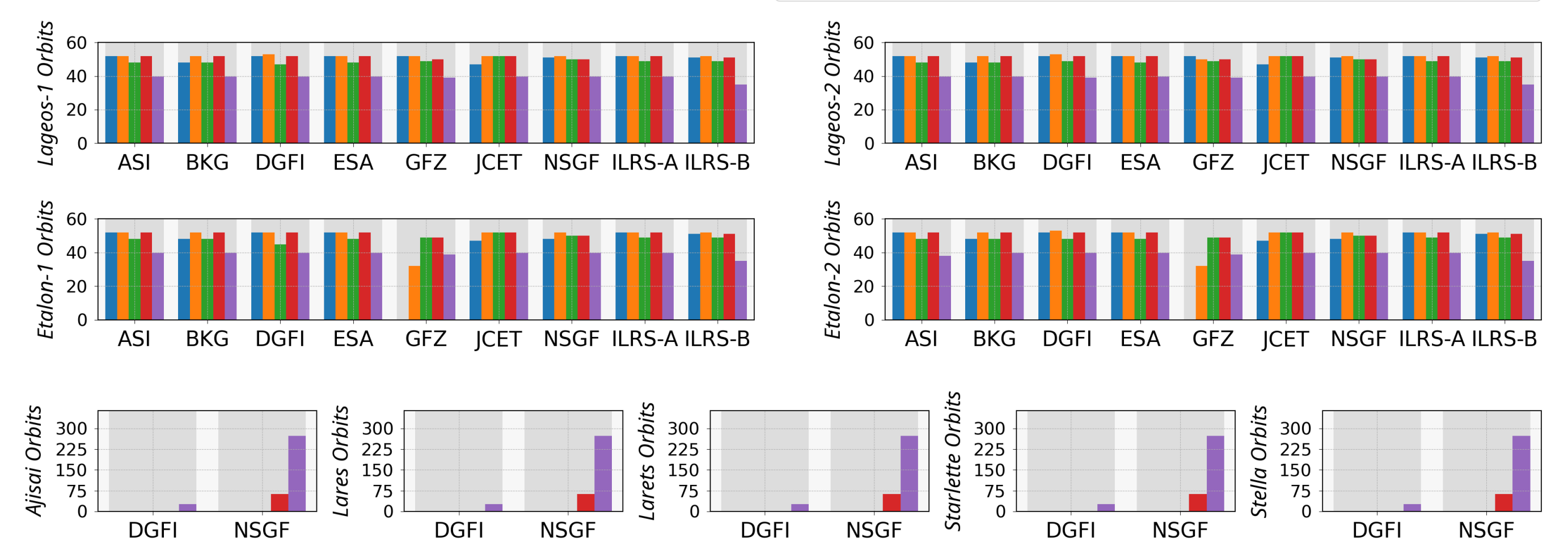Figure 8: Statistics of the EOP+POS products by AC

Figure 9: Statistics of the orbit products for 9 satellites by Analysis Center

ILRS Mailing-Lists

The EDC maintains the SLR-Mail, SLR-Reports, SLR-Urgent and Rapid Service Mail mailing lists for the information exchange within the ILRS community.

Figure 9 shows the number of mails sent to the mailing lists every year between Jan. 2018 and Oct. 2022.
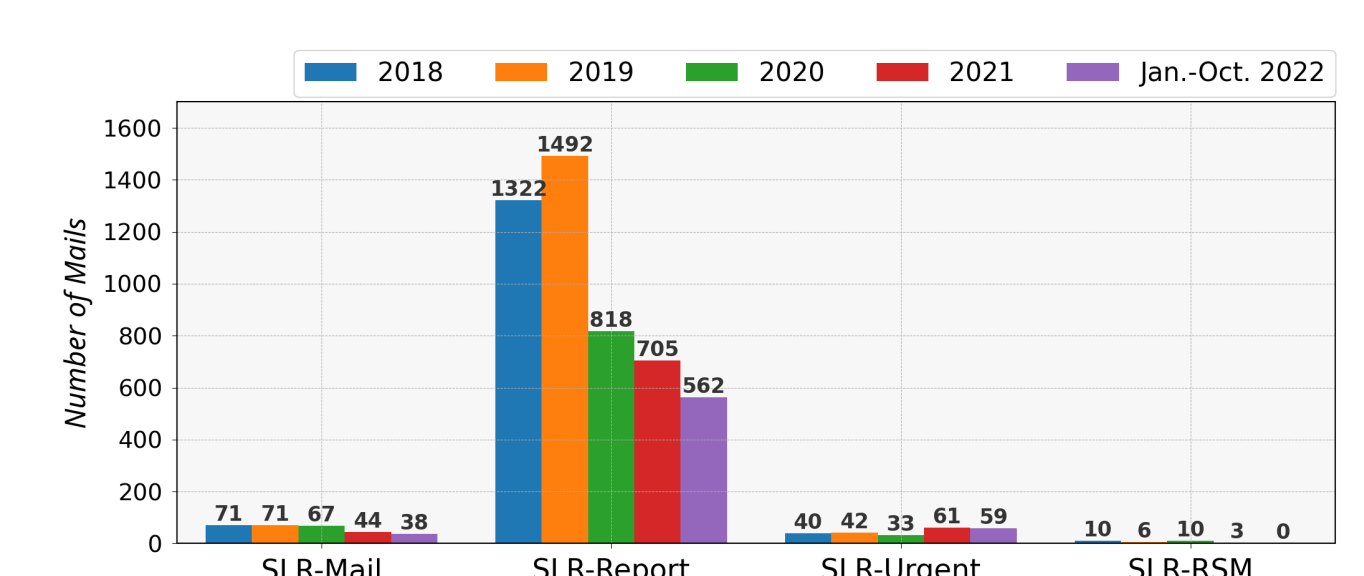

Figure 10: Statistics of SLR mailing lists

References

Pearlman M.R., Degnan J.J., Bosworth J.M.: "**The International Laser Ranging Service**". Advances in Space Research, Vol.30, No. 2, 135-143, 2002

Noll C.E., Ricklefs R., Horvath J., Müller H., Schwatke C., Torrence M.: **Information resources supporting scientific research for the international laser ranging service**. Journal of Geodesy, 10.1007/s00190-018-1207-2, 2018