

Evaluation service for real-time orbit and clock satellite

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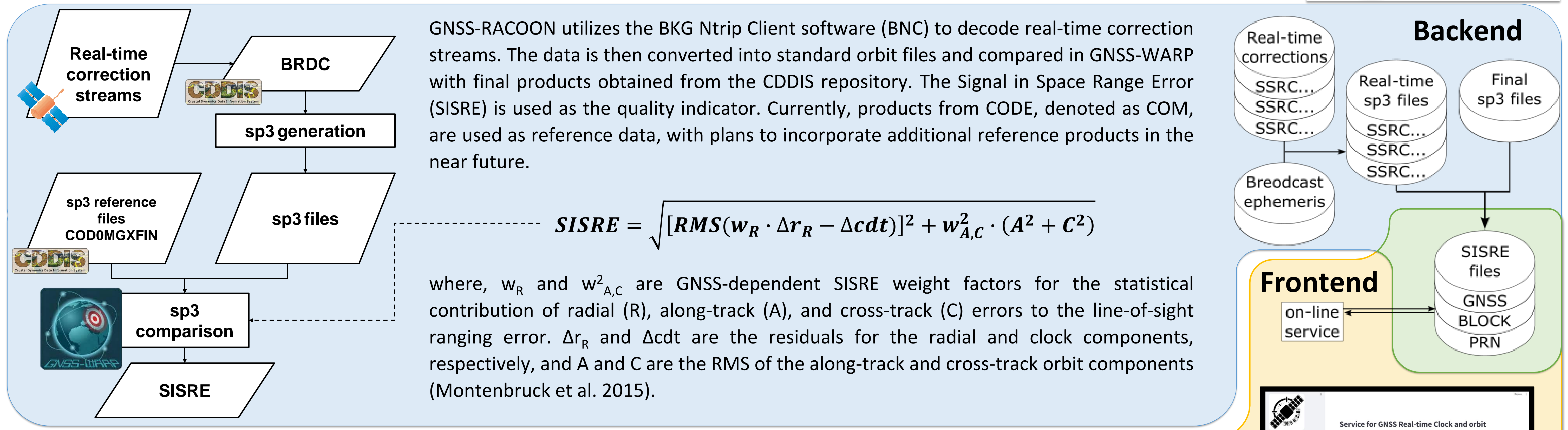
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Introduction

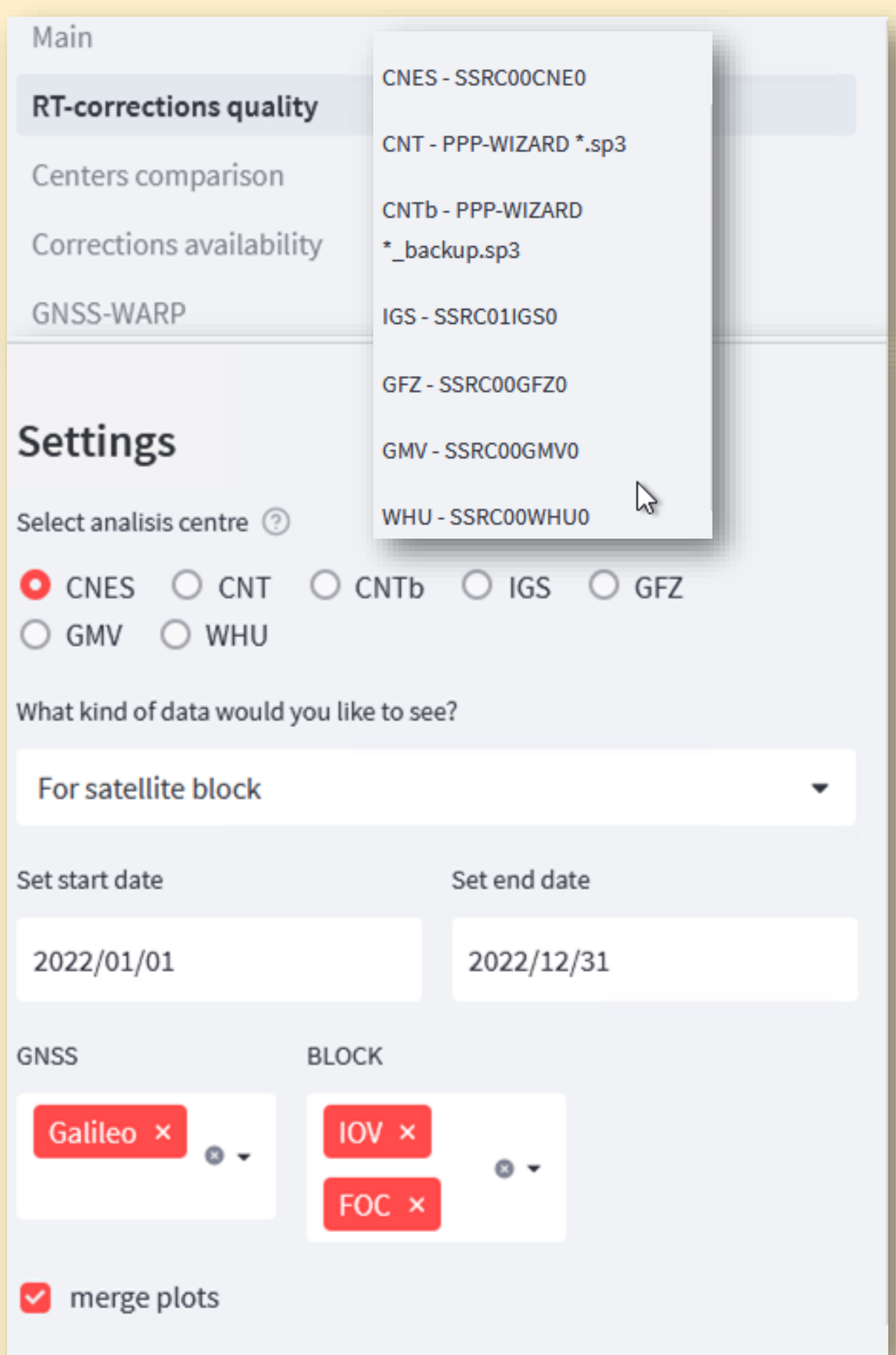
Since 2013, when the IGS launched the first Internet data stream, real-time precise positioning applications have benefited from clock and orbit corrections. Currently, multi-GNSS corrections are provided by several Analysis Centers (ACs), including the Centre National d'Études Spatiales (CNES), the European Space Agency (ESA), and the Helmholtz Centre Potsdam German Research Centre for Geosciences (GFZ). In addition to clock and orbit corrections, selected ACs also offer ionospheric maps, code and phase biases, the latter being crucial for integer ambiguity resolution in PPP. Although the quality of the PPP solution directly depends on the quality of the products, validating the quality of incoming real-time corrections is almost impossible.

Service architecture



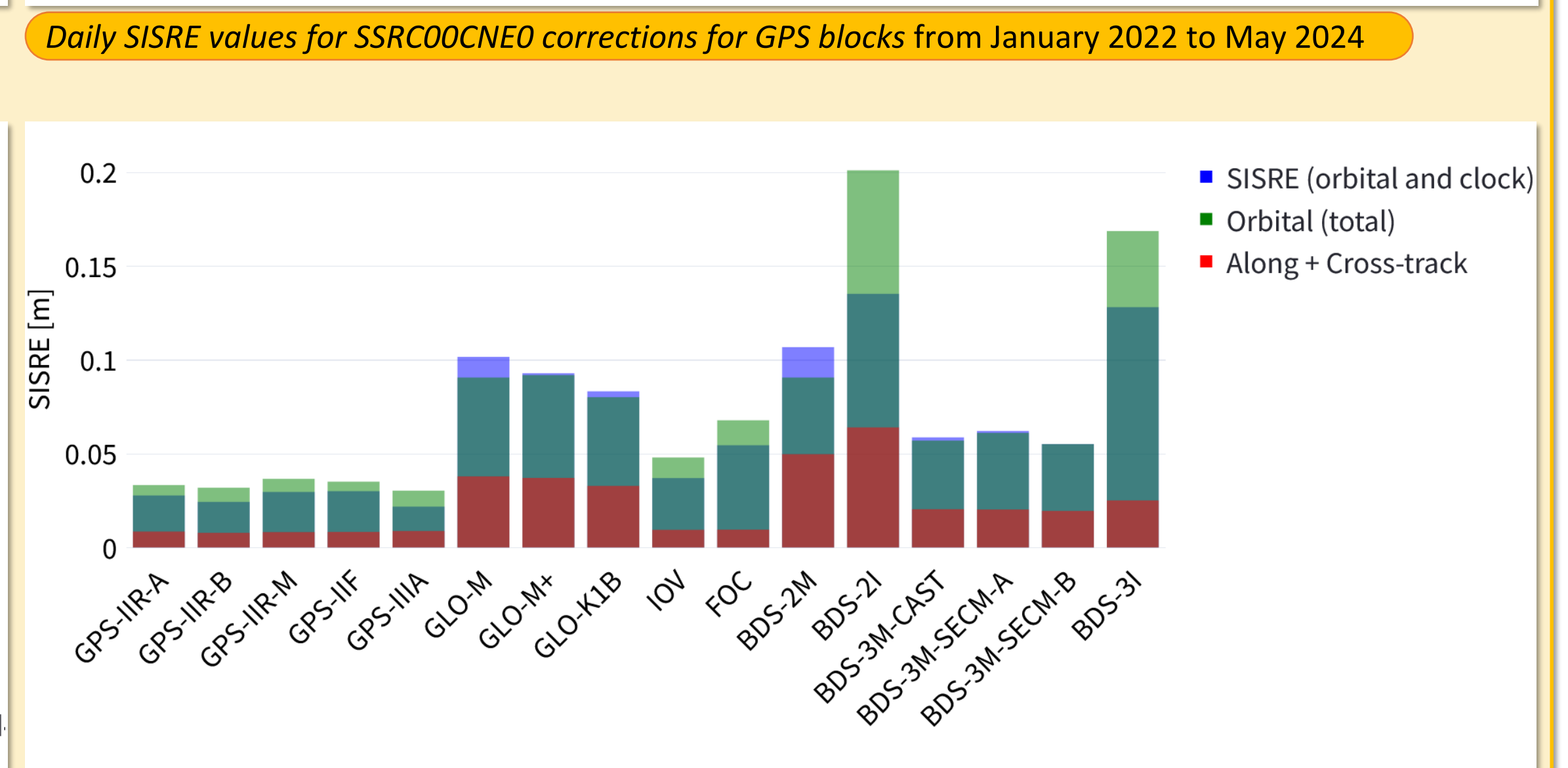
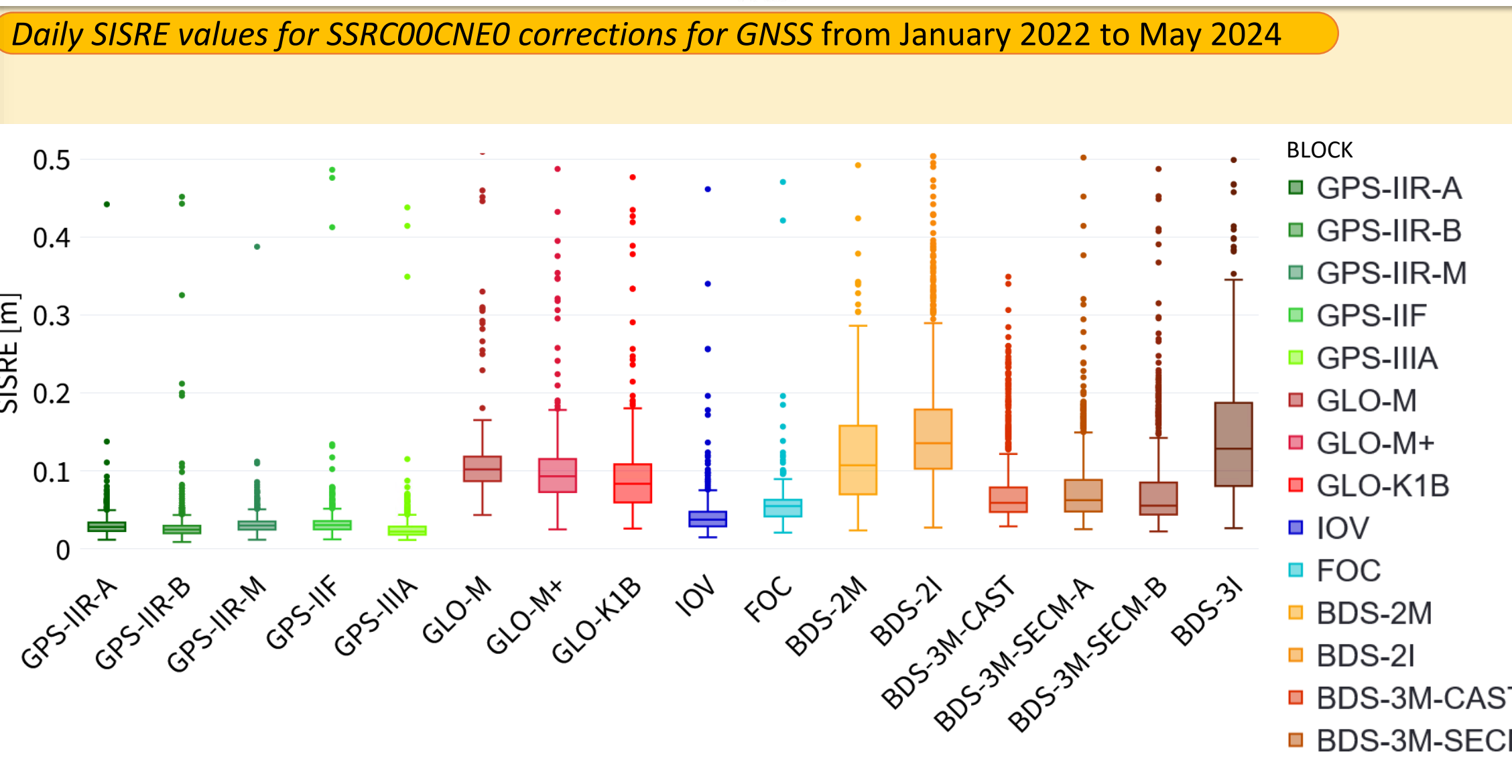
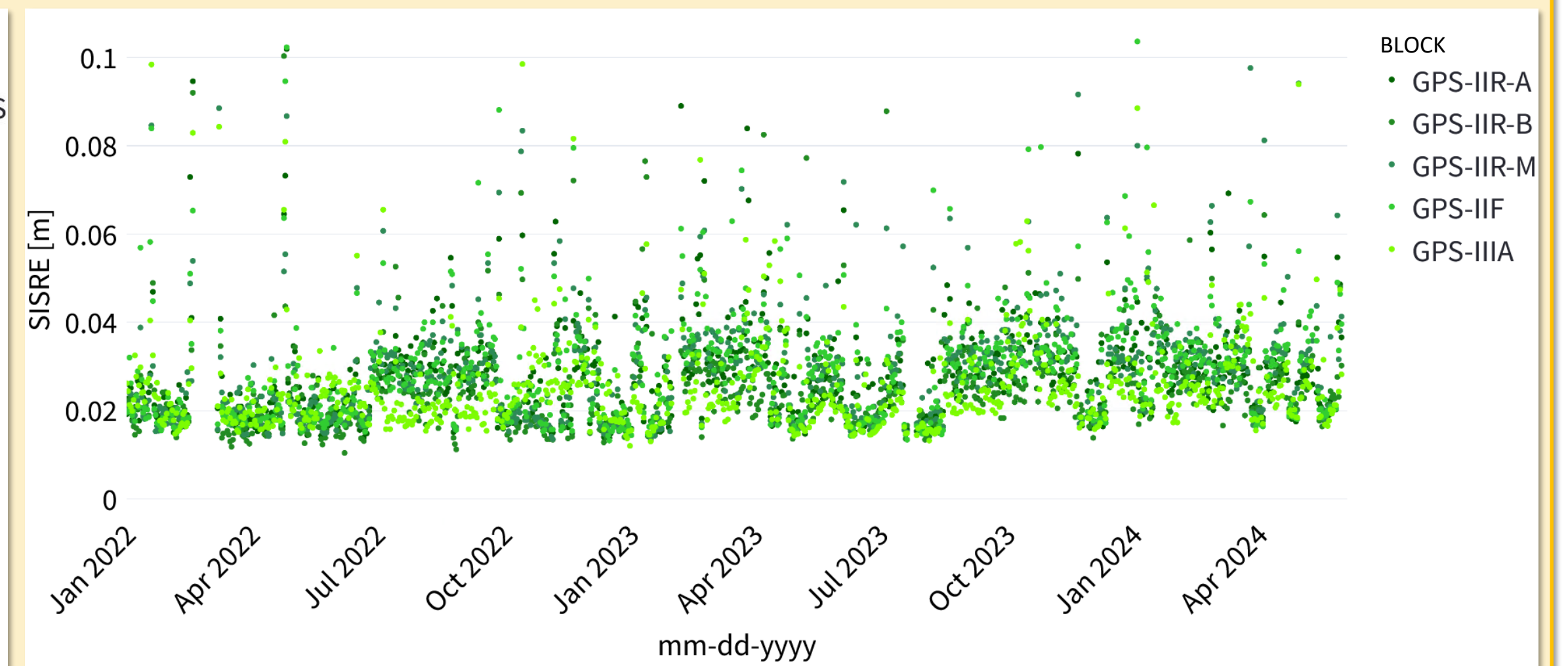
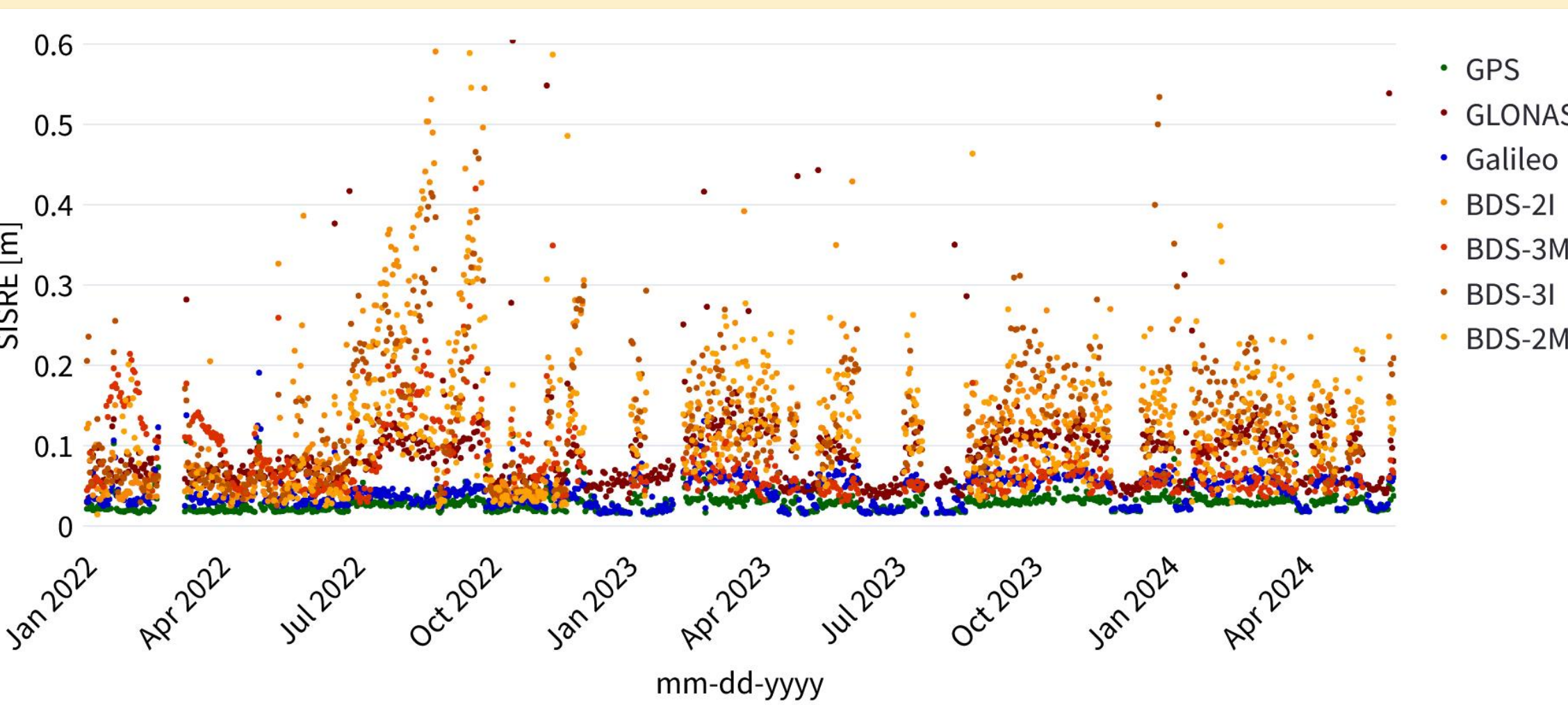
Subpages and available options

Several real-time products and display options are available. The service provides also the capability to display quality information for GNSS, GNSS blocks/types, and quality information for each satellite independently

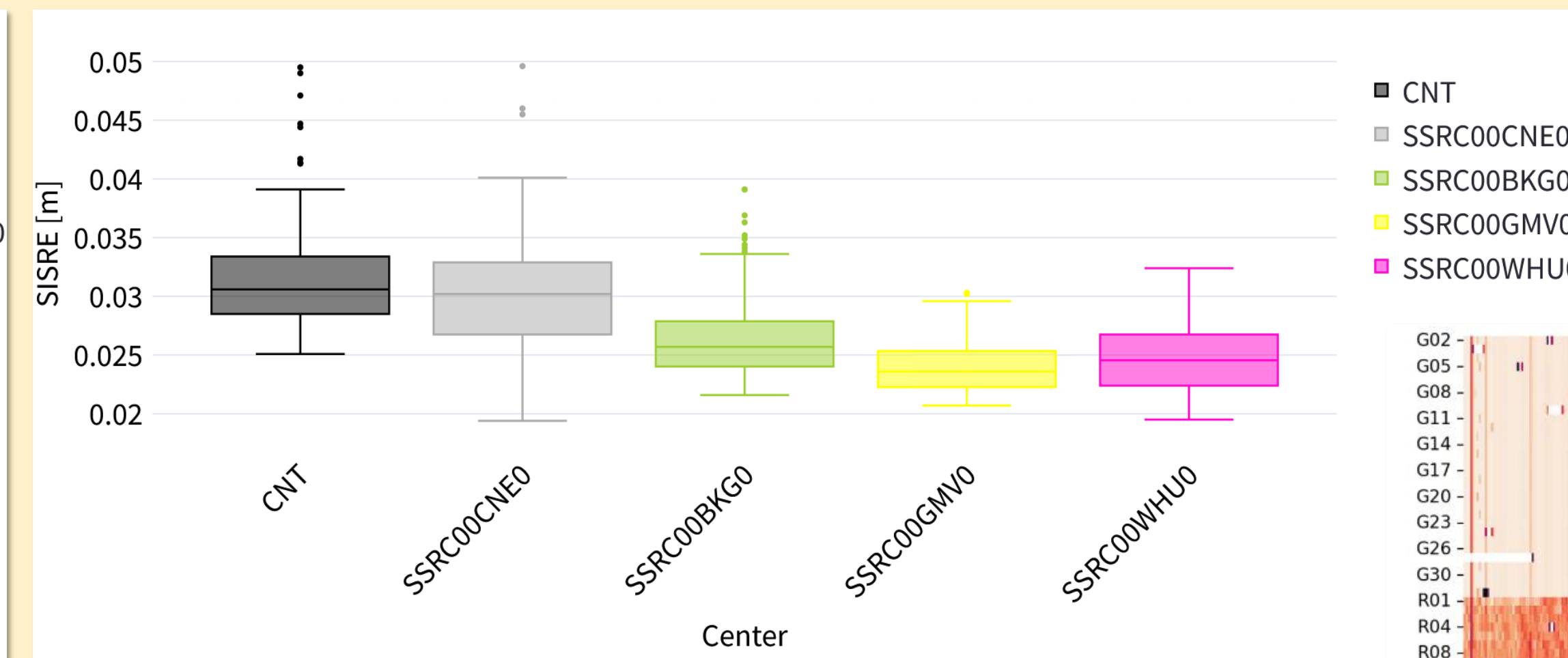
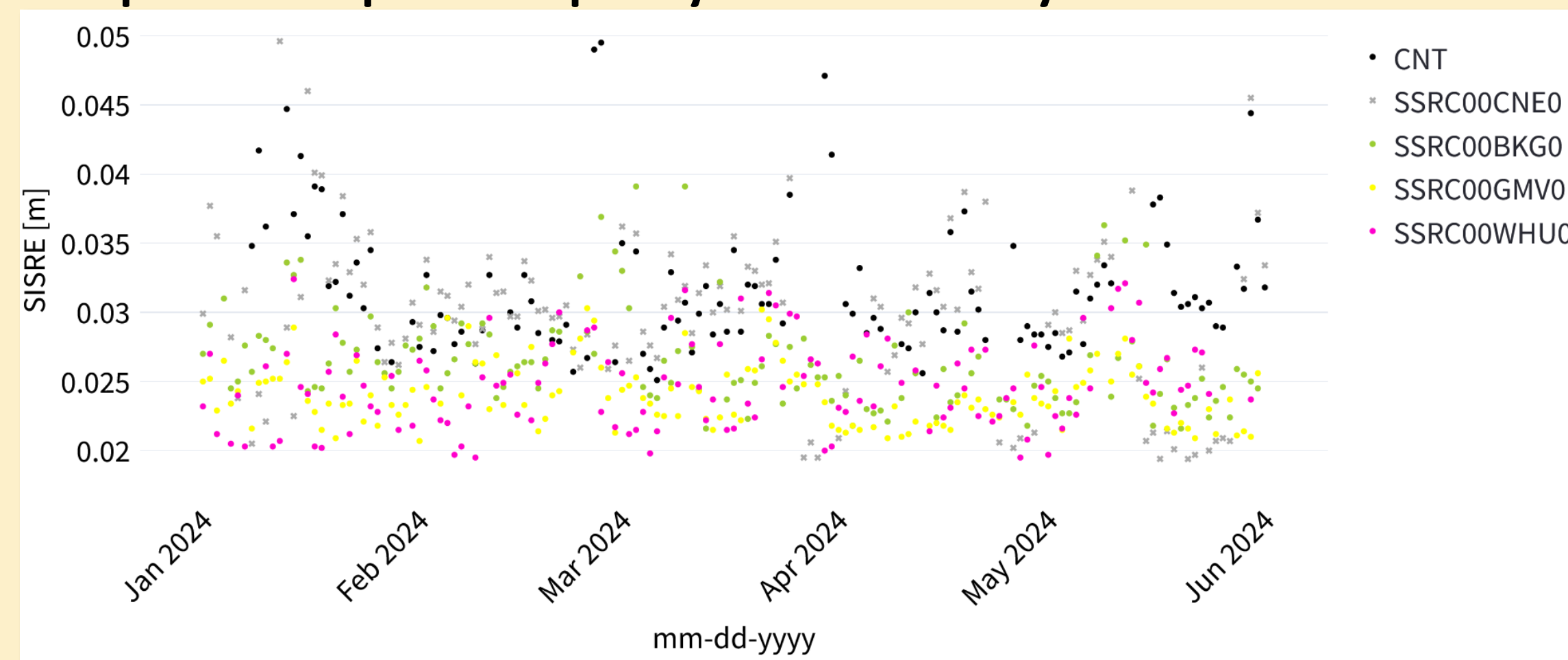


Single center products quality

Users can visualize information about the quality of real-time products for the chosen analysis center, considering the selected options. All plots are interactive, enhancing the readability of the presented data.

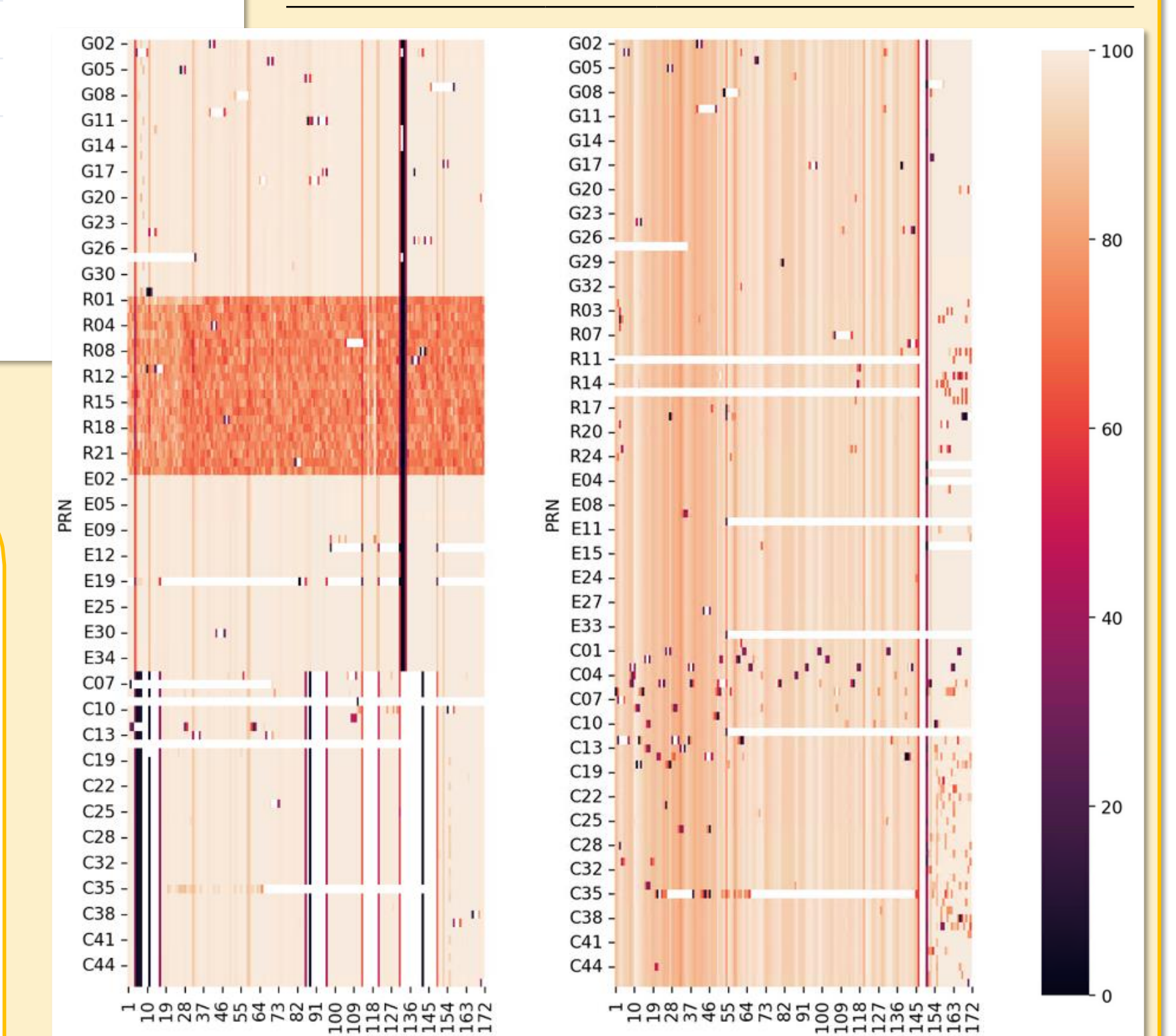


Comparison of product quality between analysis centers



Daily SISRE statistics for Galileo for different ACs in 2024

| | median | mean | min | max |
|------------|--------|------|------|------|
| SSRC00BKGO | 0.03 | 0.03 | 0.02 | 0.04 |
| SSRC00CNE0 | 0.05 | 0.05 | 0.02 | 0.07 |
| SSRC00GFZO | 0.06 | 0.06 | 0.04 | 0.08 |
| SSRC00WHUO | 0.02 | 0.02 | 0.02 | 0.03 |



Conclusions

The data presented in this system allow us to evaluate the quality of real-time streams, which is crucial in GNSS data processing. It particularly aids the development and enhancement of algorithms through stochastic modeling. Additionally, these data can serve as an independent verification source for correction providers. The diverse analyses available in the service clearly differentiate the performance of various real-time streams in terms of corrections availability and product accuracy over extended periods. Although the results are delayed due to the latency of final products, they provide independent validation useful for the GNSS community to select a stream for data processing or for analysis centers to improve products. The system will be publicly available soon.