



## EGNOS SERVICE NOTICE

Number: 025

Version: 1.0

**To:** EGNOS Safety of Life and Open Service Users

**Date:** 04/05/2023

**Subject:** Potential EGNOS underperformance due to Solar Cycle

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This Service Notice provides information on the EGNOS Safety of Life (SoL) and Open Service (OS) observed and expected performances. In the current period of high Solar activity performance can deviate from the corresponding EGNOS [SoL](#) and [OS](#) Service Definition Documents (SDDs) in force, mainly over the North and South of Europe.

For Safety of Life users, the EGNOS SoL service integrity is not compromised at any moment, remaining safe at all times and locations within the EGNOS coverage area.

### ***1 SOLAR CYCLE AND EGNOS PERFORMANCE***

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Solar cycle #25 begun around December 2019 and the solar activity maximum is expected to occur between 2023 and 2026. The impact in EGNOS services is observed since the beginning of 2022, mainly in the North and South of Europe with regards to the normal levels of SoL APV-I & LPV-200 (both Availability and Continuity parameters) and OS performances, and has increased with the evolution of the solar cycle, reaching the highest impact so far during the first quarter of 2023. This increase is observed in the following plot, being possible to observe that the measured values are significantly higher than the predicted ones.

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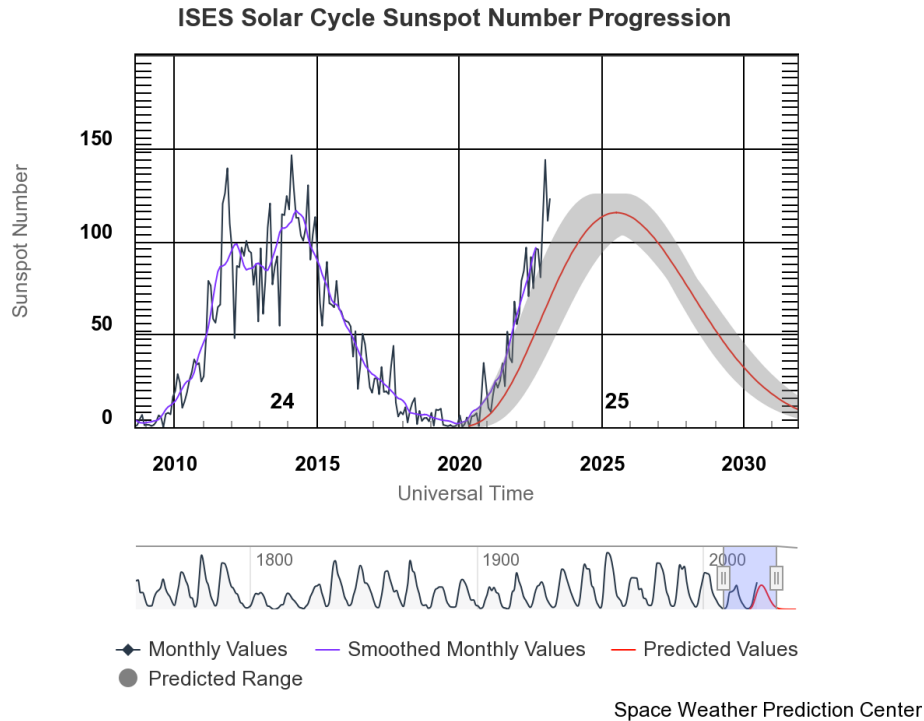


Figure 1. Solar Cycle Sunspot Number (source <https://www.swpc.noaa.gov/>)

Since the occurrence of these underperformances is linked to the ionospheric behaviour it is not possible either to estimate the number of occurrences or to accurately forecast the evolution of this degradation.

However, ESSP, as part of its established procedures, keeps all affected users duly informed through the proper channels and mechanisms, including the interfaces defined in the EGNOS Working Agreement (EWA) for the SoL Signatories, and continues monitoring closely the evolution of each observed degradation event until its conclusion.

At Programme Level, the EGNOS 2.4.2.B release, which is foreseen to be deployed by Q4 2023, will provide additional robustness against these degradations. It is also to be noted that the impact of the Solar Cycle will be removed with the introduction of EGNOS V3 in the coming years for dual frequency users.

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## 2 EXAMPLE OF SOLAR CYCLE IMPACTING EGNOS

As an example of the observed underperformance, the next maps show the SoL APV-I and LPV-200 Availability and Continuity and OS Availability performance in the period from 1<sup>st</sup> to 31<sup>st</sup> January 2023, which was a period significantly impacted by ionosphere disturbances linked to the Solar Cycle. The most affected regions are typically those located in the North (above 65° N) and in the South (below 35° N), even if, during periods with very high solar activity, the underperformance could reach also other areas inside these limits.

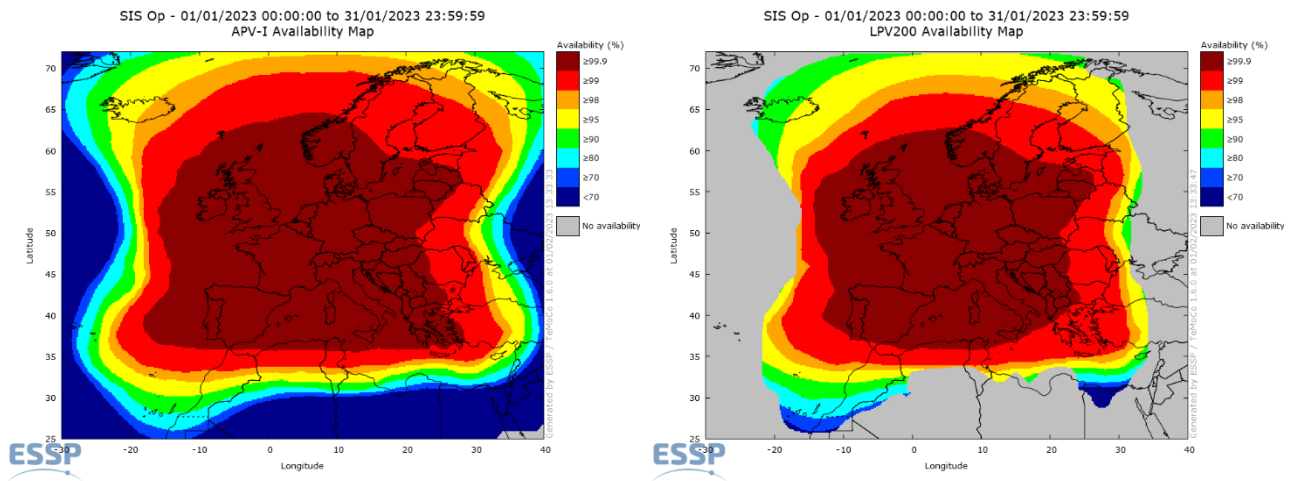


Figure 2. APV-I (left) and LPV-200 (right) Availability map (1<sup>st</sup> to 31<sup>st</sup> January 2023)

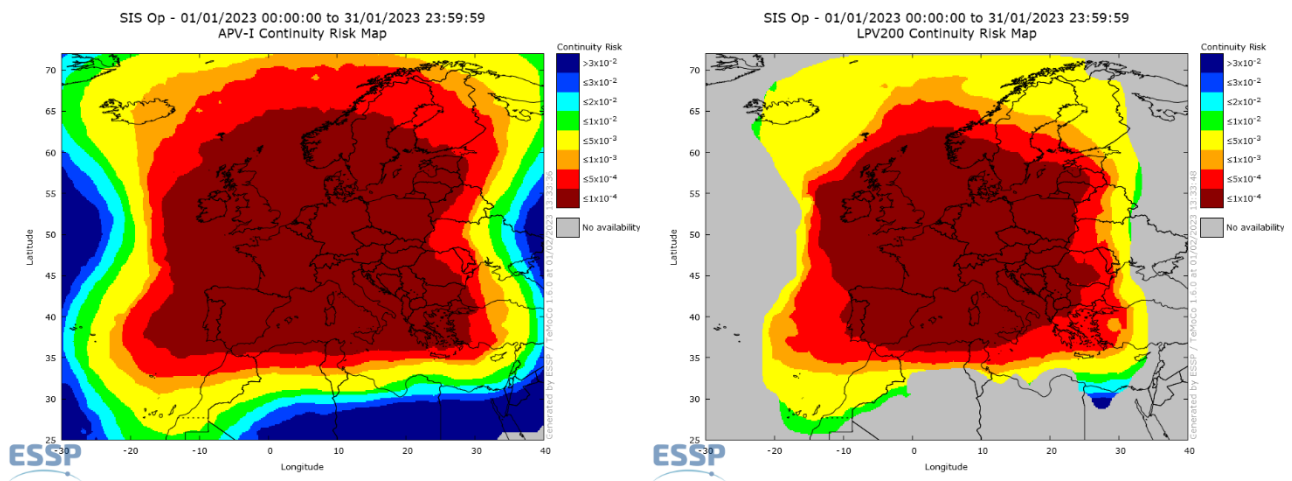


Figure 3. APV-I (left) and LPV-200 (right) Continuity map (1<sup>st</sup> to 31<sup>st</sup> January 2023)

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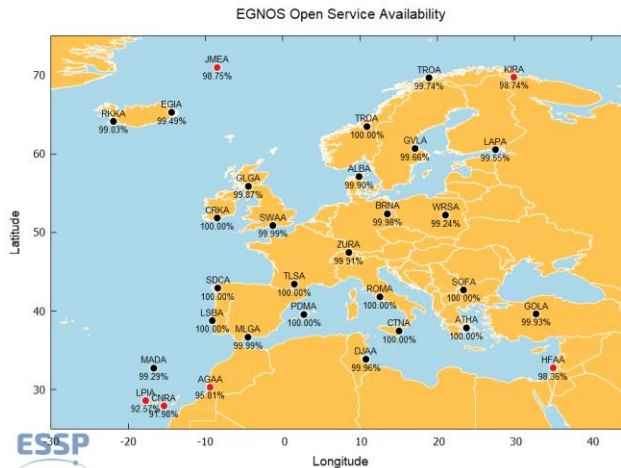


Figure 4. OS Availability performance (1<sup>st</sup> to 31<sup>st</sup> January 2023)

The analyses performed confirm that the main reasons of these degradations are directly caused by the behaviour of the ionosphere in this period, linked to the increase of the solar activity.

More detailed information and results can be found at the EGNOS User Support website (<https://egnos-user-support.essp-sas.eu>) including daily performance results, real-time status of EGNOS performance, trending for the last 14 days and real-time LPV availability for all the airports with EGNOS-based operations published (specific information for the aviation users can be found at the Aviation Portal - <https://egnos-user-support.essp-sas.eu/aviation-portal>).

### CONTACT US

Should you have any question related to this Service Notice or EGNOS, please, contact [egnos-helpdesk@essp-sas.eu](mailto:egnos-helpdesk@essp-sas.eu) or +34 911 236 555 (H24/7)

For more information about EGNOS, please, visit the EGNOS User Support website at <https://egnos-user-support.essp-sas.eu>