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# INTERNATIONAL CIVIL AVIATION ORGANIZATION

A UN SPECIALIZED AGENCY



# ICAO WRC-27 Preparatory Workshop

## Agenda item 1.17: Space weather sensors

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# Presentation Overview

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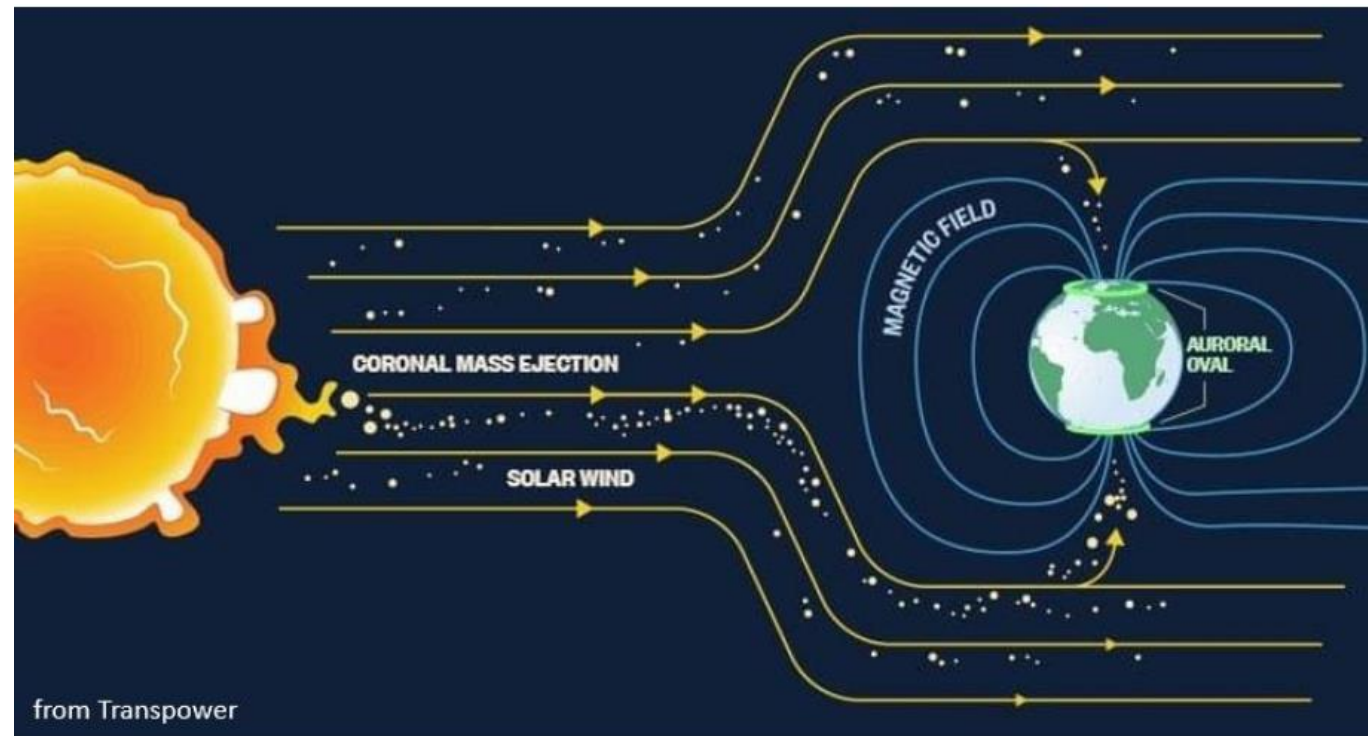
Conclusion

## Background

**WMO definition of space weather:** *“The physical and phenomenological state of the natural space environment, including the Sun and the interplanetary and planetary environments.”*

Space weather phenomena include:

- Geomagnetic storm
- Solar radiation storms
- Solar flare radio blackouts
- Solar radio bursts
- Cosmic radiation



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## Background

### Space weather sensor frequency needs:

- Relative Ionospheric Opacity: observe ionospheric absorption events that can degrade or obscure HF communications lasting minutes to several days, potentially disrupting aeronautical communications on polar and high-latitude flights
- Solar radio flux monitor / solar spectrograph: Monitor short term solar radio burst.

### Frequency band under consideration in Res 682 (passive sensors):

- 27.5 – 28 MHz
- 29.7 – 30.2 MHz
- 32.2 – 32.6 Mhz
- 37.5 – 38.325 MHz
- 73 – 74.6 MHz
- 608 – 614 MHz

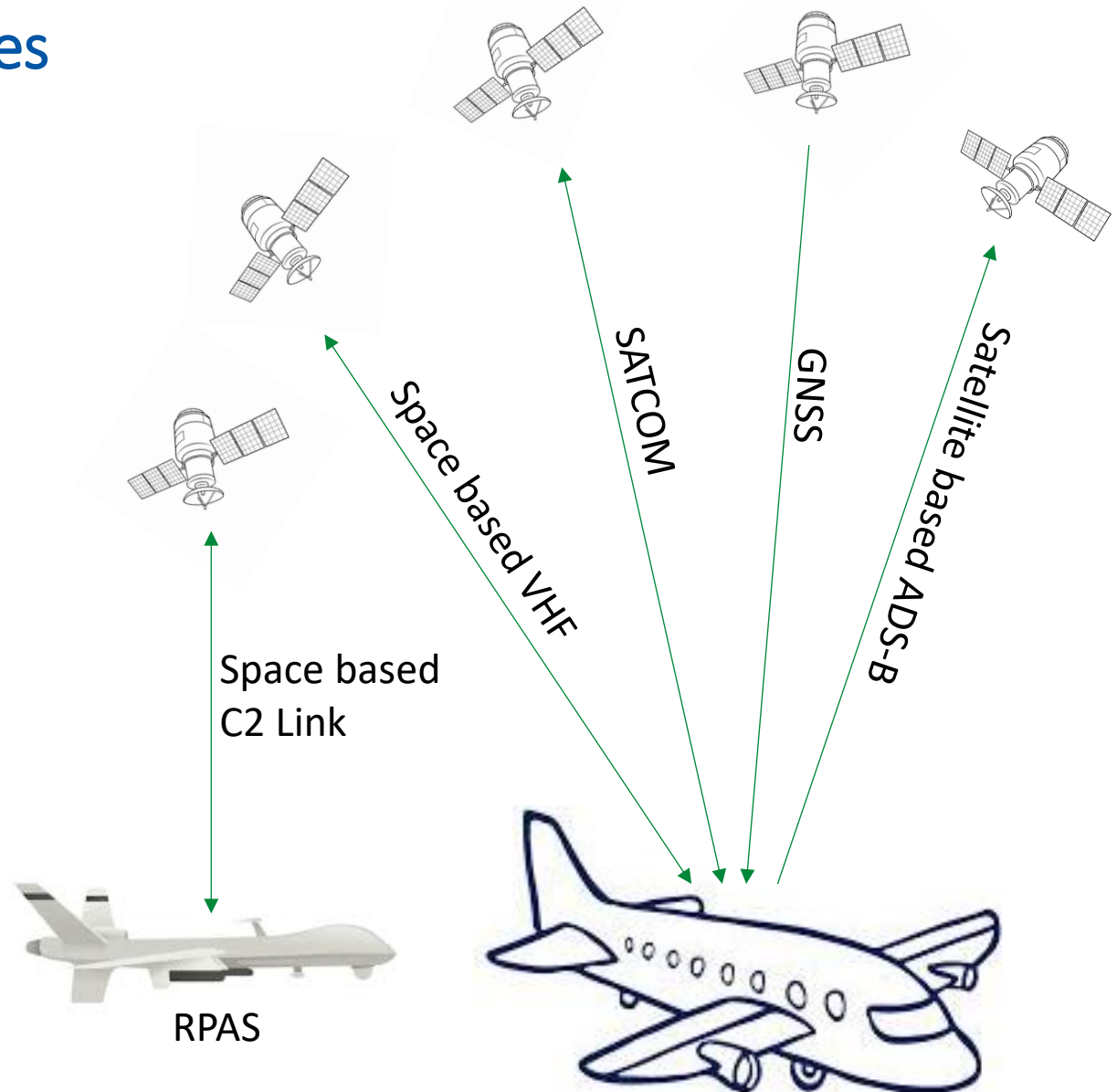
## Potential issues... or opportunities

### Impact of space weather on civil aviation:

- Degradation of satellite communications
- On-board system failure due to radiation
- Higher ionizing radiation dose
- Degradation of magnetic equipment (e.g, compass)
- Degradation of electrical systems

Civil aviation benefits from space weather forecast

➔ ICAO Doc 10100: *Manual on Space Weather Information in Support of International Air Navigation*



## 1.17 ICAO position

To support the appropriate radio regulatory changes for receive-only space weather sensors (excluding active sensors) while ensuring, based on the ITU-R studies as called for by Resolution 682 (WRC-23), any changes would not impose any technical or regulatory constraints on aviation safety systems.

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## Conclusion

This agenda item explores regulatory provisions and potential primary allocations to the meteorological aids service (space weather) to accommodate receive-only space weather sensor applications in the Radio Regulations

Civil aviation would benefit from space weather monitoring and forecast

As a consequence, ICAO supports this agenda item, ), provided that any changes would not impose any technical or regulatory constraints on aviation safety systems.

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# Thank You

