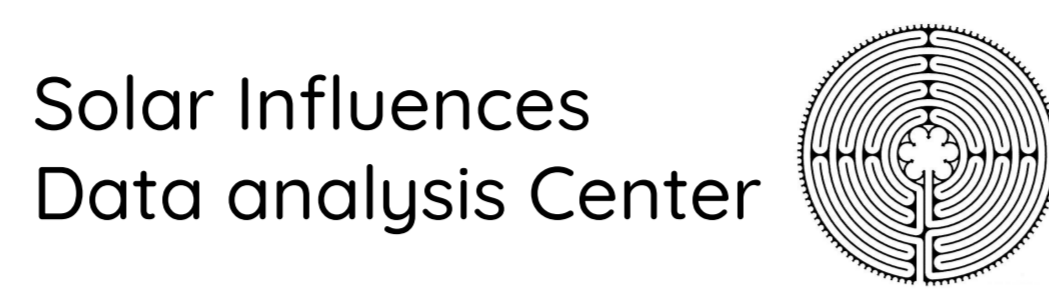
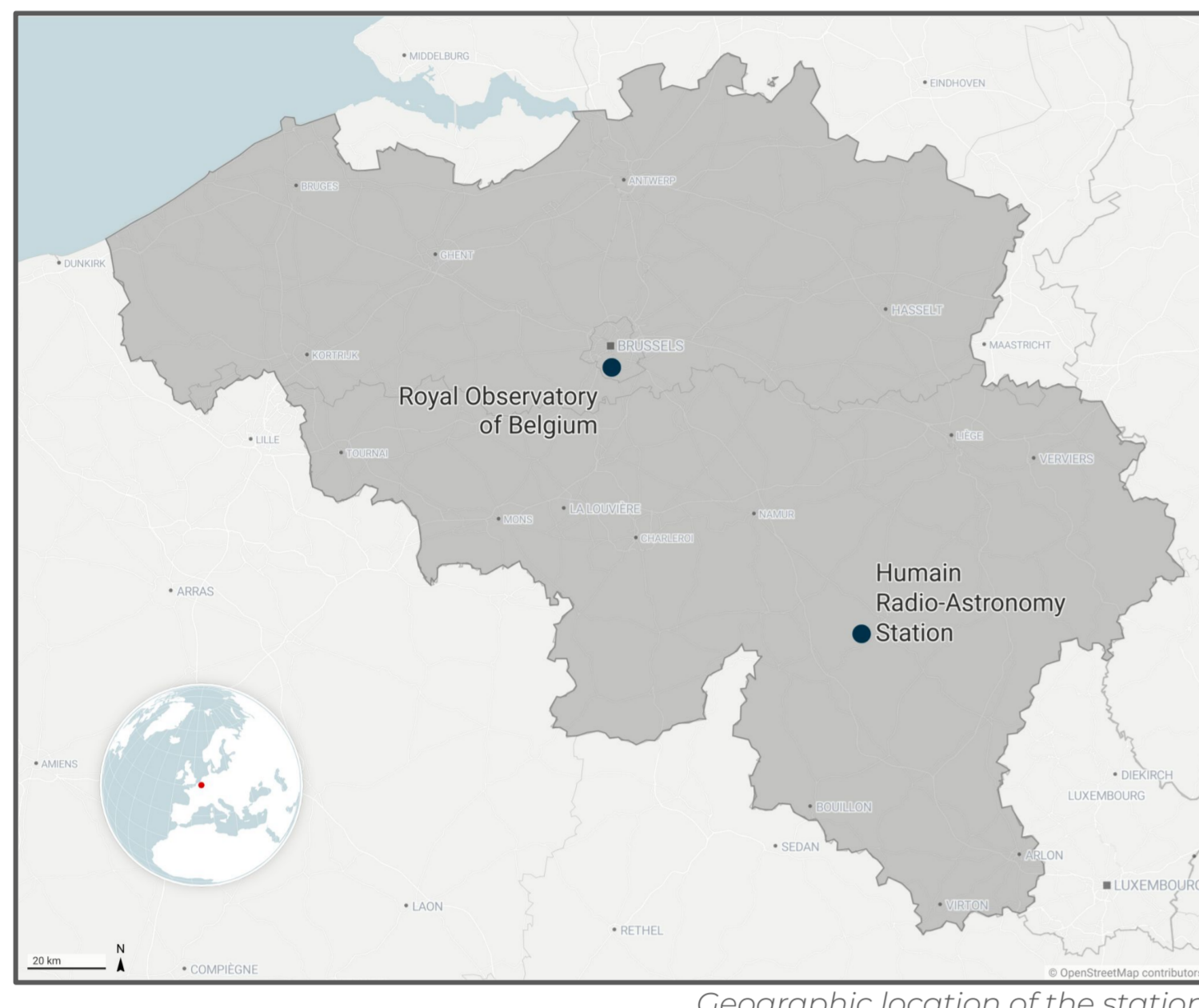


HUMAIN RADIO-ASTRONOMY STATION

Current Status & Collaborative Opportunities



Antonio Martínez Picar – Christophe Marqué – Akhil Gunessee – Déborah Mouhaou – Jasmina Magdalenič



The Solar Influences Data analysis Center (SIDC) at the Royal Observatory of Belgium is advancing solar research with its solar radio-astronomy station in Humain, located in the southern region of Belgium.

Objective: Monitor solar activity in metric and microwave range

Goal: Provide near real-time information on eruptive events



Bird's eye view of the station

-1°C 23°C 950 mm/year
108 250 m² Radio quiet zone

TELESCOPES & INSTRUMENTS

Instrument Type	Status												
<p>8x inverted "v" antennas</p> <p>SPADE</p> <p>Solar Radio Spectrometers</p> <p>Main Features</p> <table border="1"> <tr> <th>Frequency Resolution (kHz)</th> <th>Time Resolution (ms)</th> <th>Nbr of Channels</th> </tr> <tr> <td>63</td> <td>250</td> <td>200</td> </tr> <tr> <td>98</td> <td>84</td> <td>4200</td> </tr> <tr> <td>98</td> <td>250</td> <td>12500</td> </tr> </table>	Frequency Resolution (kHz)	Time Resolution (ms)	Nbr of Channels	63	250	200	98	84	4200	98	250	12500	Commissioning
Frequency Resolution (kHz)	Time Resolution (ms)	Nbr of Channels											
63	250	200											
98	84	4200											
98	250	12500											
<p>Log-Periodic Antenna -Piggy Back-</p> <p>CALLISTO</p> <p>ARCAS</p>	Operational												
<p>6m parabolic dish</p> <p>HSRS</p>	Operational												
<p>6m parabolic dish</p> <p>OART</p> <p>General Radio-Astronomy (Public/Educational)</p>	Operational												
<p>4m parabolic dish</p> <p>SAFIRE</p> <p>Solar Flux Monitoring</p>	Development												
<p>ANT-61</p>	Operational												
<p>ANT-62</p>	Operational												
<p>ANT-34</p>	Operational												

Frequency chart of the instruments

ACTIVITIES & PRODUCTS

Automated tracking
UPS management
Monitoring
Testing
Integration
Courses
Planning
Build
Design
AI analysis
Measurements
Log-periodic antenna
Software-defined Radio
Configuring Science Production
Calibration
3D printing
Spectrograms
Light curves
Hands-On
Seminars
Development
Instrumentation
Documentation
Sensors
RF filters
Simulations
CAD/CAM
Mechanical refurbishment
Temperature regulation
Feed antennas
Observations
Briefings & Meetings
Phased array

SPADE array pattern simulation

SDR receivers of SPADE

HUMAN 2017/09/06
Solar light-curves obtained from HSRS

Underdense meteor echoes
detected by CALLISTO

Solar Radio Burst registered by CALLISTO

GOES X-ray Flux | Human radio spectra (ARCAS + HSRS)

ANT-61 pattern measurement with an UAV

2019-11-15 Radio flux density, e-CALLISTO (HUMAN)

Solar radio burst detected by machine learning algorithm over CALLISTO data

Engineering student working on SPADE field array

Preliminary solar radio flux observations on SAFIRE