

**Earth Energy Imbalance Explorer (EAGER)**

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In the climate community there is growing need to determine the global Energy budget, in particular Earth's energy imbalance (EEI). This requires observations of the global energy budget at the top of the atmosphere (TOA) and the Solar Spectral Irradiance (SSI) at an accuracy and long-term stability not available from current observations. To address these issues, we propose the Earth enerGy imbalance ExploreR (EAGER) mission, which will – for the first time – determine the EEI through measuring both incoming Total Solar Irradiance (TSI) as well as the outgoing thermal and reflected solar radiation at the TOA with the same instrument type. To further ensure the highest possible accuracy and stability for the EEI observations, in-flight calibration of the solar observations will be enabled through applying the DARA TSI sensors in combination with transfer filters as a reference for the SSI observations, complemented by an ionisation chamber for the calibration in the EUV wavelength range. Similarly, for the Earth observations, fast bolometric sensors will be calibrated by an Earth-pointing DARA instrument. Ultimately, using the DARA TSI instrument as imbalance monitor and at the same time as calibration facility in space will allow us to determine the EEI with the required precision.