SolO-PAS_data product description

The product contains density N, speed vector V, pressure tensor P, temperature components (Tx, Ty, Tz), and the velocity of the satellite V_solo, computed using the data collected by the Proton-Alpha Sensor (PAS) onboard Solar Orbiter.

PAS measures the 3D distribution functions of the dominant ions of the solar wind, from 200 eV to 20 KeV, without mass and charge selection. In practice, this concerns mostly the proton and alfa populations (unseparated). At full resolution, PAS collects the 3D ion distribution function in about 1 second, even though the moments have a cadence of 4 seconds, while in "snapshot" mode the phase space sampling is reduced, allowing a greater cadence for the moments.

Data is hosted on http://soar.esac.esa.int/soar/

List of the relevant papers that present the data and their typical usage.

- "First Solar Orbiter observation of the Alfvénic slow wind and identification of its solar source", R. D'Amicis *et al*, Astronomy &Astrophysics 656, A21 (2021)
- Magnetic reconnection as a mechanism to produce multiple thermal proton populations and beams locally in the solar wind, B. Lavraud *et al*, Astronomy &Astrophysics 656, A37 (2021)
- "Evolution of coronal hole solar wind in the inner heliosphere: Combined observations by Solar Orbiter and Parker Solar Probe", D. Perrone *et al*, Astronomy &Astrophysics 668, A189 (2022)
- "Innovative technique for separating proton core, proton beam, and alpha particles in solar wind 3D velocity distribution functions", R. De Marco *et al*, Astronomy &Astrophysics, 669, A108 (2023)