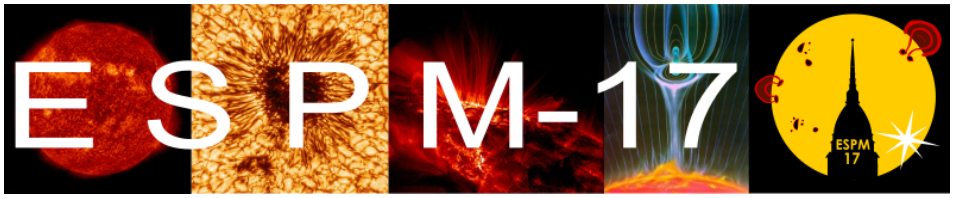

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High-resolution observations of small-scale activity in coronal hole plumes

Coronal hole plumes, largely radial ray-like structures located in coronal holes, are often the targets of studies of magnetohydrodynamic waves and of solar wind origins in the corona. The plume bases seem to be very active with many small-scale transients observed, which are likely important to the formation and evolution of plumes and could contribute to the solar wind. We study three plumes within an equatorial coronal hole observed on 13 October 2022 by the High Resolution EUV telescope, part of the Extreme Ultraviolet Imager on board Solar Orbiter. By applying two different identification techniques, we detect tens to hundreds of small-scale brightenings at the plume bases. The statistical analysis of their properties (intensity, lifetime, area, shape, velocity) indicates that the majority of the observed brightenings are characterized by their small-scale nature (occupying an area less than 1.3 Mm^2), transient behavior (with a lifespan of less than 5 minutes), and display slightly elongated morphologies near the plume bases. The intensities of brightenings from different plumes are similar once the plume brightness is taken into account. Most of the brightenings appear to move with a velocity component in the plane of sky of less than 10 km/s. We correct the plane of sky speeds by considering the magnetic field data acquired by the Polarimetric and Helioseismic Imager on Solar Orbiter. Still, their 3-dimensional velocities are found to be substantially lower than (and difficult to reconcile with) the apparent outflow velocities (~100 km/s) detected at greater heights in the plumes.

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