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Small Space Science Missions (2)

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SIHLA - SPATIAL/SPECTRAL IMAGING OF HYDROGEN LYMAN ALPHA

**Abstract**

SIHLA is a small satellite mission proposed as a Mission of Opportunity to NASA for flight on the same launch as the NASA IMA mission. SIHLA is a free-flyer that is carried into a geosynchronous transfer orbit (GTO) on the ESPA-Grande ring. The SIHLA spacecraft flies to the L1 point. From there SIHLA will map the distribution of H in the heliosphere. SIHLA takes an existing scanning imaging spectrograph (SIS) and adds a Hydrogen Absorption Cell (HAC). From the L1 point, outside of the Earth's atmosphere and H exosphere, SIHLA is able to map the sky without the absorption of the terrestrial H. The SIS produces spectral images from 115nm to 180 nm – including the H Lyman  $\alpha$  line – at all points in the sky. SIHLA uses the HAC, and our observing geometry, to sample, over time, the

entire H Lyman  $\alpha$  lineshape. The line-of-sight integrated lineshape contains within it information on the density, temperature and velocity of Heliospheric H. Remote sensing measurements from SIHLA, and our international team, continue the legacy of SOHO/SWAN into the next solar cycle. SIHLA's enhanced capabilities will provide new insights into the Heliospheric boundary and the processes that shape the distribution of H within the heliosphere. These new and unique observations from SIHLA, together with IMAP and Voyager 2, will lead to a revolution in our understanding of the ISM-Heliosphere interaction.