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[Invited Lecture]

High Resolution in Situ observations at Lagrange 1 Point and Earth's Bow-Shock: past, present, and future

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Abstract: The terrestrial bow shock provides a unique laboratory for investigation of properties of collisionless shocks using in situ measurements under a wide range of conditions appearing over several solar cycles. The measurements at the bow shock and at L1 point upstream of the shock have amounted to a legacy of three full solar cycles at 4s resolution for electron, and a minimum of 92s resolution for ion measurements over several missions, proving a comprehensive database for space weather research. We review the current datasets capabilities, the major scientific outcomes, and provide an overview of current and future multi-point observations with missions such as Magnetospheric Multiscale (MMS) and Helioswarm missions.

Keywords: solar wind, plasma instabilities, thermal noise