

**Properties of shocks observed during the ascent and descent of Ulysses in latitude**

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As Ulysses left the solar equator in 1992 traveling toward the south pole, the large radial distance of  $\approx 5$  AU ensured the frequent observation of forward and reverse shocks accompanying Corotating Interaction Regions (CIRs) as well as some shocks associated with coronal mass ejections. Using high resolution magnetic field and plasma data, numerous shocks have been identified and analyzed. The CIR shocks persisted to a helio-latitude of  $\approx -50^\circ$  with forward shocks disappearing first. The shocks have been characterized by the usual three parameters: upstream plasma beta ( $\beta$ ), the angle between the shock normal and the upstream field direction ( $\theta_{BN}$ ) and the fast magnetosonic Mach number ( $M_f$ ). These parameters have been found to exhibit a dependence on latitude. The shock normals confirm the tendency for high latitude forward shocks to propagate equatorward while the reverse shocks propagate poleward. In the latitude range in which large recurrent high speed streams were occurring, the shocks are supercritical implying ion heating is important and is influencing the shock structure as well as energetic particle acceleration. Shocks which have recently reappeared, at  $-35^\circ$  and at a heliocentric distance of 1.5 AU, will also be discussed.

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4. SH

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