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How to Change Noncompressive Plasmas into Compressive Ones and Low β Plasmas into High β Ones: Alfven Waves (Intermediate Shocks?) and Fast Shocks

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Magnetic Decreases (MDs) have been identified and studied throughout a Ulysses fast latitude scan that lasted from 29 February 1992 to 14 September 1993. Ulysses' distance was about 5 AU from the sun. MDs were found to occur in high occurrence frequency "clusters" with the top ten peak events varying in magnitude from 116/day to 36/day. For comparative purposes, quiet, nonpeak intervals had an occurrence rate of 4.3 ± 6.1 MDs/day. MD clusters were often found to occur within corotating interaction regions (CIRs), specifically localized in the high β trailing portions of CIRs between the interfaces (IFs) and the reverse shocks (RSs) and also downstream of high β ICME forward shocks. The mechanisms for MD formation will be explored. Phase steepening of nonlinear Alfvén waves will be emphasized. As a sidelight to this study, we show how nature creates compressive magnetic structures and also high β plasmas.