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Compressional energy entry into the dayside magnetosphere

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There are currently gaps in our understanding of ultra low frequency (ULF) waves in Earth's magnetosphere. One gap concerns the entry of compressional Pc5 (˜1 - 8 mHz) energy and waves at the dayside magnetopause. We will demonstrate the flow of compressional Pc5 fluctuations from the solar wind through the magnetosphere for events in 2002 using the S3C Great Observatory: specifically, Wind and ACE in the solar wind, Geotail at the magnetopause (and magnetotail) and GOES and Cluster in the inner magnetosphere. We will show cases where the wave structure and the frequency spectrum between compressional fluctuations at Pc5 frequencies in the solar wind and on the dayside at geosynchronous orbit are essentially equivalent, suggesting that the fluctuations are directly transmitted. We will show the 3D structure of the ULF wave field inside the magnetosphere as derived from the Lyon-Fedder-Mobbary (LFM) global MHD code driven with modulated solar wind input. Although our statistical study of the solar wind conditions and IMF orientations for transmission is in its initial phase we will discuss preliminary results and characterization of Pc5 waves in the dayside sector.