Bursty, Broadband Electromagnetic Waves Associated with Three-Dimensional Nulls Observed in Turbulent Magnetosheath Reconnection

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We investigate observations of intense bursts of electromagnetic wave energy in association with the thin current layers of turbulent magnetosheath reconnection. These observed emissions — typically detected in the layers immediately outside of the current layer proper — form two distinct types: (i) broadband emissions that extend continuously to 10s of Hertz; and (ii) structured bursts of emitted energy that occur above 80-Hz, often displaying features reminiscent of absorption bands and are observed near the local minima in the magnetic field. We present detailed analyses of these intense bursts of electromagnetic energy and quantify their proximity to X-/O-nulls and magnetic spine connected null pairs, as well as their correlation — if any — to the amount of magnetic energy converted by the process of magnetic reconnection.