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# Invited: Mesoscale solar wind density structures created by interchange reconnection in the solar corona

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Decades of density measurements made throughout the inner heliosphere show that the solar wind is often comprised of mesoscale structures. One type of mesoscale solar wind structure manifests as periodic trains of density enhancements, with scales of 0.2 mHz (~90 minutes) to 5 mHz (~ a few minutes). Periodic density structures directly drive oscillations in Earth's magnetosphere as a forced-breathing, wherein each density structure engulfs the magnetosphere, squeezing it as it passes. This interaction drives ultralow frequency waves in the magnetosphere and periodic dynamics in Earth's radiation belts. Additionally, periodic density structures are important diagnostics of solar wind formation. Studies of composition during these periodic density structures demonstrates that they are created at the Sun as the solar wind is formed. White light imaging data of the corona and young solar wind have shown that the source of the longest/largest of these trains of periodic density structures is likely helmet streamers. A possible source of the higher-frequency periodic density structures is interchange reconnection along Separatrix-web arcs in the solar corona, periodically driven by jetlets and/or transverse Alfvenic fluctuation.

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