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# Recent Advancements in Kelvin-Helmholtz Instability Occurring in Earth's Magnetopause coupled with Magnetic Reconnection

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## Abstract

Two key mechanisms governing the Sun-Earth interaction are thought to be magnetic reconnection (RX) and the Kelvin-Helmholtz instability (KHI). Recent high-time resolution observations and start-of-the-art simulations revealed that KHI can lead to the onset of RX and vice versa. This highlights the close linkage between KHI and RX, the effects of which can propagate to the entire global system. This presentation focuses on recent advancements in understanding the multi-scale effects of KHI coupled with RX on Earth's magnetopause. their global effects. While the roles and impacts of RX is well-established, those of KHI are less highlighted. In this context, we provide in-situ observations of KH waves from MMS in its string-of-pearls configuration. This presentation may offer insights into the future MMS research optimized for flank-side magnetopause dynamics, a less-explored area in Heliophysics research.

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