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**Whistler Instabilities in the Solar Wind: Linear Analysis**[1]
JOSEPH TORSIELLO, ILYA KUZICHEV, New Jersey Inst of Tech, IVAN VASKO, Space Sciences Laboratory, University of California at Berkeley — Whistler waves in the solar wind and at interplanetary shocks have drawn a lot of attention due to their potential role in the heat flux regulation and electron scattering that results in formation of typical solar wind electron velocity distribution functions (eVDF). Modern satellite measurements provided conclusive evidence that whistler waves are generated locally via whistler heat flux instabilities. Such experimental successes have driven theoretical and modelling efforts to understand the influence of locally generated whistler waves on the particles, which demonstrated different roles played by parallel, anti-parallel, and oblique waves. But so far, observational evidence for oblique and anti-parallel whistler waves in the solar wind is rather scarce, whereby the majority are parallel. At the same time, eVDF observations often demonstrate that hot electrons have temperature anisotropy that may drive the generation of anti-parallel whistler waves. In this report, we present the results of the linear stability analysis of a large dataset of eVDFs observed by the Wind spacecraft. We analyze the conditions for generation of parallel and anti-parallel waves and provide quasilinear estimates for the saturated amplitudes.

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