

# TURBULENCE GENERATED BY TAIL COLLISIONS OF KINETIC ALFVÉN WAVES

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In this talk I will relax the widely used implicit assumption that the kinetic-scale Alfvénic turbulence is generated by the head collisions among counter-propagating kinetic Alfvén waves (KAWs). Such assumption is made by analogy with MHD Alfvén waves propagating with the same velocity, which excludes their tail collisions. However, KAWs have different velocities (depending on their perpendicular wavenumbers) and hence can collide even if they propagate in the same direction along the background magnetic field. Applying the critical balance condition, it is shown that the strong turbulence of co-propagating KAWs has spectra significantly steeper than the  $-7/3$  spectrum of counter-propagating KAWs found before. Steep kinetic-scale turbulent spectra often observed in the solar wind can be formed by the tail collisions among co-propagating KAWs. Other consequences of the tail collisions are shortly discussed.