

Abstract Submitted  
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**Modeling of resonant sweeping of Alfvén waves in divergent solar wind** VALENTIN SHEVCHENKO, VITALY GALINSKY, ECE UCSD — Sweeping mechanism of absorption of Alfvén wave energy in the divergent solar wind is modeled using a scale-separation approach.<sup>1</sup> MHD waves are excited through reconnection at the sun with frequencies below the local ion cyclotron frequency. The fluctuations with highest frequencies will be absorbed by heavy ions as the wave packet propagates within the lower corona in the outward direction in decreasing magnetic field. At larger distances smaller frequencies will fall in cyclotron resonance with heavy ions but the wave absorption can eventually stop as the heavy ions form the shell-like distribution. Amplitude at these frequencies can even grow due to secondary cyclotron instability<sup>2</sup>. Part of the wave spectrum can reach at some distance the cyclotron frequency of  $\alpha$ -particles where the same picture will take place. The remaining low frequency part of the spectrum that falls in cyclotron resonance with protons at larger distances from the sun will be responsible for the solar wind heating and acceleration. We answer the questions: “Will the wave spectrum be completely absorbed by minor heavy ions and  $\alpha$ -particles?” and “Do we need some additional mechanism of generation of the MHD waves interacting with protons?”

<sup>1</sup>Galinsky V.L. and V.I. Shevchenko, *Phys. Rev. Lett*, **85**, 90, (2000)

<sup>2</sup>V. Shevchenko et al., *Phys. Plasmas*, **11**, 4290, (2004)

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