Abstract Submitted
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Quasilinear Evolution from Whistler and KAW Turbulence in the High Beta Solar Wind[1] MANISH MITHAIWALA, Naval Research Laboratory, LEONID RUDAKOV, Icarus Research Inc., GURUDAS GANGULI, CHRIS CRABTREE, Naval Research Laboratory — The electron and ion distribution functions resulting from quasi-linear diffusion in the turbulent solar wind plasma is calculated using the measured spectrum of the kinetic Alfven wave (KAW) fluctuations. Quasi-linear diffusion establishes a step-like profile on the distribution function over parallel velocity [1]. It is shown that the dispersion relation for whistler waves is identical for a high or low beta plasma. Furthermore in the high-beta solar wind plasma whistler waves meet the Landau resonance with electrons for velocities less than the thermal speed, and consequently the electric force is small compared to the mirror force. However, the whistlers are not damped since the background kinetic Alfven wave turbulence creates a plateau by quasilinear diffusion in the solar wind electron distribution at small velocities. The diffusion coefficient for whistlers in a high beta plasma is determined from mirror force, while the KAW diffusion is determined from the electric and mirror force. The size of "plateau" v_{me}, which can be created within the time of travel of solar wind plasma to the Earth $> 10^5$ s, is estimated for electrons as $vme/ve \sim 0.5$. For a whistler spectrum similar to that of KAW, it is found that for whistler energy density of only $\sim 10^{-3}$ of the kinetic Alfven waves, the quasilinear diffusion rate due to whistlers and KAW are comparable. Thus very small amplitude whistler turbulence can have a significant consequence on the evolution of the solar wind electron distribution function. [1] L. Rudakov, M. Mithaiwala, G. Ganguli, and C. Crabtree. Phys. Plasmas **18**, 012307 (2011)

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