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Non-Maxwellian Core-electron Distribution Functions in the Solar Wind[1] MANISH MITHAIWALA, Naval Research Laboratory, LEONID RUDAKOV, Icarus Research Inc., GURUDAS GANGULI, CHRIS CRABTREE, Naval Research Laboratory — Electron velocity distribution functions in the solar wind are generally characterized by a thermal "core," a superthermal "halo," and field aligned 'strahl' electrons. The core distribution is mostly modeled as a bi-Maxwellian distribution, even though the solar wind is nearly collisonless and kinetic wave-particle interactions are expected to be dominant. It has been shown that the non-linear scattering (NLS) by plasma particles due to Landau resonance with beat waves play a fundamental role for low-beta magnetospheric plasmas [1, 2]. However for high-beta solar-wind plasma the rate of the linear Landau damping by electrons with a Maxwellian distribution could prevail over NLS [3]. Furthermore in the high-beta solar wind plasma kinetic Alfven wave (KAW) and whistler waves meet the Landau resonance with electrons for velocities less than the electron thermal speed and greater than the Alfven speed. The measured spectrum of KAW fluctuations in the turbulent solar wind plasma is used to calculate the electron distribution functions resulting from quasi-linear diffusion. Quasi-linear diffusion establishes a step-like profile in the electron distribution function for parallel velocity for speeds larger than the Alfven speed. For parallel velocities less than the Alfven velocity, evolution of the distribution due to the beat resonance of waves is considered. [1] Ganguli et al., (2010) *Phys. Plasmas* **17**, 052310; [2] Rudakov et al., (2011) *Phys. Plasma*, **18**, 012307; [3] Mithaiwala et al., (2012) *Phys. Plasmas*, **18**, 055710

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