Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Particle acceleration by quasi-parallel shocks in the solar wind[1]
V.L. GALINSKY, V.I. SHEVCHENKO, University of California San Diego — The theoretical study of proton acceleration at a quasi-parallel shock due to interaction with Alfven waves self-consistently excited in both upstream and downstream regions was conducted using a scale-separation model [1]. The model uses conservation laws and resonance conditions to find where waves will be generated or dumped and hence particles will be pitch–angle scattered as well as the change of the wave energy due to instability or damping. It includes in consideration the total distribution function (the bulk plasma and high energy tail), so no any assumptions (e.g. seed populations, or some ad-hoc escape rate of accelerated particles) are required. The dynamics of ion acceleration by the November 11-12, 1978 interplanetary traveling shock was investigated and compared with the observations [2] as well as with solution obtained using the so-called convection-diffusion equation for distribution function of accelerated particles [3]. [1] Galinsky, V.L., and V.I. Shevchenko, Astrophys. J., 669, L109, 2007. [2] Kennel, C.F., F.W. Coroniti, F.L. Scarf, W.A. Livesey, C.T. Russell, E.J. Smith, K.P. Wenzel, and M. Scholer, J. Geophys. Res. 91, 11,917, 1986. [3] Gordon B.E., M.A. Lee, E. Mobius, and K.J. Trattner, J. Geophys. Res., 104, 28,263, 1990.

[1]Work supported by NASA.

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Date submitted: 21 Jul 2008 Electronic form version 1.4