

## Nonlinear interaction of MHD pulse and charged particle

# Yasuhiro Kuramitsu[1], Tohru Hada[2]

[1] ESST, Kyushu Univ., [2] ESST, Kyushu Univ

[http://www.esst.kyushu-u.ac.jp/CDS/index\\_j.html](http://www.esst.kyushu-u.ac.jp/CDS/index_j.html)

Charged particles can be Fermi accelerated efficiently in a presence of spatially correlated MHD waves by successive mirror reflection. In order to construct a statistical model of this process, we study interaction of an MHD pulse and a charged particle. When the particle velocity ( $v$ ) is small (adiabatic regime), the probability ( $P$ ) that the particle be reflected by the pulse is essentially determined by the pitch angle only, and is thus independent of  $v$ , while in the non-adiabatic regime  $P$  is shown to decrease as  $v^{*-1/2}$ . We discuss our numerical as well as analytical results of the interaction process with various pulse amplitude, pulse shape, and the pulse winding number.