The expectations of the simple model are verified by our *ab initio* calculations [Figs. 3(c) and 3(d)]. Ferromagnetism is favored at all separations for Cr and Mn pairs.

Focusing on Mn-doped GaAs, we extract J_{ij} [18] from E_{FM}-E_{AFM} of Fig. 3(d) for different orientations of Mn

orientation comes from the dependence of the hopping matrix element entering the FM energy stabilization. This is different from any dependencies within the RKKY mechanism that arise from nonspherical Fermi surface [19]. The mechanism discussed here based on *p-d* hopping is not unique to dilute magnetic semiconductors, but is common to a wide class of materials. It was first introduced to explain the robust ferromagnetic state of Sr_2FeMoO_6 [11]. In the present work, we have pointed out another novel aspect of this mechanism in terms of its specifi