Video S1:

A magnetic bead (Dynabead M-270) transported between adjacent disks by the switching of a 30 Oe out-of-plane magnetic field. Video is in real time.

Video S2:

Magnetic beads (Spherotech PMS-20-10, PMS-30-10, and PMS-40-10) transported across disk arrays at 1.5 Hz magnetic field frequency. Transport is mostly phase-locked, as particles mostly move synchronously with each other and with the external field. Video is in real time.

Video S3:

Magnetic beads (Spherotech PMS-20-10, PMS-30-10, and PMS-40-10) transported across disk arrays at 6 Hz magnetic field frequency. Transport exhibits phase-slipping behavior, though rightward motion of all particles is observed. Video is in real time.

Video S4:

Simulation of a bead (purple dot) transported at 2 Hz across three magnetic disks (black circles). Opposite poles of magnetic disks are indicated by red and blue dots, and poles rotate around disks as the simulated in-plane magnetic field is rotated. Simulated motion exhibits phase-locked behavior. (Note: simulation is not in real time.)

Video S5:

Simulation of a bead (purple dot) with simulated field frequency of 5 Hz. Simulated motion exhibits phase-slipping behavior, as bead does not transport to subsequent disk. (Note: simulation is not in real time.)