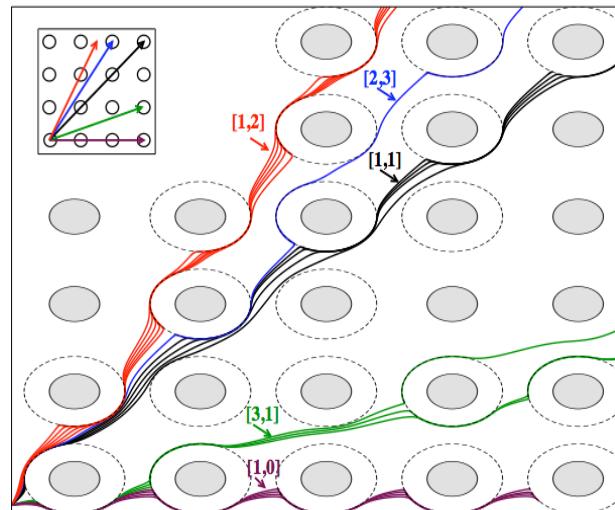


We study the transport of suspended colloidal particles in micromodels of porous media. In the picture, we can see an ordered array of PDMS *obstacles* in which we study the effect of anisotropic structures (media) on the diffusive and convective transport of finite size particles.

Transport of colloids in micromodels average motion and dispersion effects

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We have also investigated the dynamics of suspended particles in the limit of high Peclet numbers (deterministic transport). In the figure we see particle trajectories in ordered media exhibiting directional locking in the deterministic limit. Phase-locking behavior is common to transport through periodic structures in other systems, such as the motion of vortices through periodic pinning potentials in superconductors and the transport of colloidal particles through optical tweezer arrays.



We also investigated macroscopic transport in periodic systems to understand the differences and similarities with the phenomena observed at the microscale. The picture shows the motion of a sphere through an ordered array of cylinders. Directional locking was observed in these experiments in excellent agreement with our theoretical predictions and numerical results.