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Interparticle / Interchain Forces in Field-Aligned Chains within a Complex Plasma.[1] TRUELL HYDE, LORIN MATTHEWS, CASPER - Baylor University, PETER HARTMANN, CASPER - Baylor University and Wigner Research Centre for Physics, Budapest, Hungary, OLEG PETROV, CASPER - Baylor University and Joint Institute for High Temperatures, Russian Academy of Sciences, VLADIMIR NOSENKO, CASPER - Baylor University and Institute of Materials Physics in Space, German Aerospace Center (DLR), MARLENE ROSENBERG, University of California at San Diego, JIE KONG, KE QIAO, CASPER - Baylor University — Since predicted in 1934, various Wigner structures have been observed experimentally. To date, most have assembled under the presence of external system confinement, making the fundamental physics behind these correlation driven effects difficult to determine. Complex plasmas have proven a versatile analog for the study of such systems, particularly where global behavior is determined by the combined effect of the particles' low temperature/kinetic energy, interparticle interaction, global/local confinement and streaming ion flow. Of these the ion wakefield force, although of fundamental importance, is generally weaker than the others leaving its effects partially masked by gravity for terrestrial experiments. In this talk, a recently funded NASA/NSF project proposing examination of field-aligned chains formed in PK-4 microgravity experiments, where the ion flow and resulting interparticle potential can be controlled by tuning an alternating DC bias, will be discussed.

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