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Flocking Transition in Confluent Tissues MATTEO PAOLUZZI, Syracuse University, Physics Department, FABIO GIAVAZZI, MARTA MACCHI, Universit degli Studi di Milano, Dipartimento di Biotecnologie Mediche e Medicina Tradizionale, GIORGIO SCITA, Universit degli Studi di Milano, Dipartimento di Oncologia e Emato-Oncologia, ROBERTO CERBINO, Universit degli Studi di Milano, Dipartimento di Biotecnologie Mediche e Medicina Tradizionale, LISA MANNING, CRISTINA MARCHETTI, Syracuse University, Physics Department — The emerging of collective migration in biological tissues plays a pivotal role in embryonic morphogenesis, wound healing and cancer invasion. While many aspects of single cell movements are well established, the mechanisms leading to coherent displacements of cohesive cell groups are still poorly understood. Some of us recently proposed a Self-Propelled Voronoi (SPV) model of dense tissues that combines self-propelled particle models and vertex models of confluent cell layers and exhibits a liquid-solid transition as a function of cell shape and cell motility[1]. We now examine the role of cell polarization on collective cell dynamics by introducing an orientation mechanism that aligns cell polarization with local cell motility. The model predicts a density-independent flocking transition tuned by the strength of the aligning interaction, with both solid and liquid flocking states existing in different regions of parameter space.

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