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Analogy between strain-stiffening and jamming in dense flows GUSTAVO DÜRING, Facultad de Física, Pontificia Universidad Católica de Chile, EDAN LERNER, MATTHIEU WYART, CSMR, New York University, New York, USA — Dense granular and suspension flows display peculiar properties near the jamming threshold: the rheology is singular, and a diverging length scale can be identified from the velocity correlation of the particles, or from non-local effects affecting flow. In elastic networks a rigidity transition occurs when the coordination z is increased toward some threshold z_c, but can also take place if a large strain is imposed as remarked early on by Maxwell. The latter phenomenon has been proposed to cause the ubiquitous stress-stiffening observed in gels of biopolymers. In my talk I will present the critical properties of a network immersed in a fluid approaching such a strain-induced rigidity transition. Then I will argue that this transition is at play in dense suspension flows, where it corresponds microscopically to the buckling of force chains. Our predictions include the existence of a vanishing strain $\gamma \sim 1/p$ in flow near jamming, where p is the dimensionless particle pressure, and unravels the existence of two length scales affecting flow.

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