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Rate dependence, drag balance and role of disorder in linearly sheared foams. GIJS KATGERT, MATTHIAS E. MÖBIUS, MARTIN VAN HECKE, Kamerlingh Onnes Laboratory, Leiden University — We linearly shear a bidisperse foam monolayer sandwiched between a glass plate and a fluid surface over 3 orders of magnitude in driving velocity. We find strongly rate-dependent velocity profiles, which become increasingly shear banded with shear rate. We also confirm previous findings that monodisperse foam layers exhibit rate-*independent* velocity profiles. Both behaviors are quantitatively captured in a model that balances the viscous drag forces in the foam, provided that we assume the average drag force between bubbles in disordered foams to scale differently than the drag force at the bubble scale. We confirm the scaling of the drag forces in both mono- and bidisperse foams by independent rheological measurements, and confirm the crucial role of disorder on the flow of foams.

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