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Pattern formation in flowing foams. SOMA SANYAL, JAMES GLAZIER, Indiana University — We report on a new fingering morphology which an expanding air bubble generates in a foam flowing due to an applied pressure across a Hele-Shaw cell. Previous studies have only looked at patterning when the background is stationary. Our simulations using the Glazier & Grainer's Cellular Potts model show that the transition between the different morphologies depend on the rate of bubble flow into the foam. Since the rate of bubble in-flow is related to the shear strain rate, this agrees with previous experiments which have shown fingering morphologies in foams depend on the shear strain rate. The new mushroom morphology occurs for a high rate of bubble inflow corresponding to a very low shear strain rate. It is associated with a highly non-uniform velocity profile of the bubbles in the foam. These new morphologies should be easy to observe experimentally.

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