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Domain growth kinetics in stratifying foam films YIRAN ZHANG, VIVEK SHARMA, Chemical Engineering, University of Illinois at Chicago — Baking bread, brewing cappuccino, pouring beer, washing dishes, shaving, shampooing, whipping eggs and blowing bubbles all involve creation of aqueous foam films. Typical foam films consist of two surfactant-laden surfaces that are $\sim$ 5 nm – 10 micron apart. Sandwiched between these interfacial layers is a fluid that drains primarily under the influence of viscous and interfacial forces, including disjoining pressure. Interestingly, a layered ordering of micelles inside the foam films (thickness <100 nm) leads to a stepwise thinning phenomena called stratification, which results in a thickness-dependent variation in reflected light intensity, visualized as progressively darker shades of gray. Thinner, darker domains spontaneously grow within foam films. We show that the domain expansion dynamics exhibit two distinct growth regimes with characteristic scaling laws. Though several studies have focused on the expansion dynamics of isolated domains that exhibit a diffusion-like scaling, the change in expansion kinetics observed after domains contact with the Plateau border has not been reported and analyzed before.

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