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Patterns, Instabilities, Colors, and Flows in Vertical Foam Films SUBINUER YILIXIATI, EWELINA WOJCIK, YIRAN ZHANG, COLLIN PEARSALL, VIVEK SHARMA, Chemical Engineering, University of Illinois Chicago — Foams find use in many applications in daily life, industry and biology. Examples include beverages, firefighting foam, cosmetics, foams for oil recovery and foams formed by pollutants. Foams are collection of bubbles separated by thin liquid films that are stabilized against drainage by the presence of surfactant molecules. Drainage kinetics and stability of the foam are strongly influenced by surfactant type, addition of particles, proteins and polymers. In this study, we utilize the thin film interference colors as markers for identifying patterns, instabilities and flows within vertical foam films. We experimentally study the emergence of thickness fluctuations near the borders and within thinning films, and study how buoyancy, capillarity and gravity driven instabilities and flows, are affected by variation in bulk and interfacial physicochemical properties dependent on the choice of constituents.

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