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Formation and fluctuations of domains at the edges of membranes self-assembled from bidisperse filamentous phages JEROME FUNG, ZVONIMIR DOGIC, Brandeis University — When a non-adsorbing polymer is added to a colloidal suspension of $\sim 1\text{-}\mu\text{m}$ -long, $\sim 7\text{-nm}$ -diameter chiral filamentous phages, the resulting depletion attraction between the phages can cause them to self-assemble into monolayer membranes. Here we consider membranes assembled from mixtures composed of approximately 20% $1.3\text{-}\mu\text{m}$ -long M13K07 phages and 80% 880-nm -long fd-Y21M phages. At sufficiently high polymer concentrations, we observe the formation of domains rich in M13K07 within a single membrane. Depending on the handedness of the tilt at the membrane edge, these domains can either coat the membrane edge in a uniformly thick layer or protrude into the membrane bulk in arch-like threads. We probe the free energy of these domains by measuring the thermal fluctuations of the shape of their edges and relate our observations to the underlying chiral interactions between the phages.

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