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Interfaces between immiscible large and small block copolymers RUSSELL SPENCER, MARK MATSEN, Univ of Waterloo — Experiments and theory have shown that mixtures of short and long symmetric AB diblock copolymers macrophase separate if their sizes differ by more than a factor of about five. Here we examine the interface between the two coexisting phases using self-consistent field theory (SCFT). The presence of periodic order in this phase-separated system confers novelty to this problem, in both potential applications and the challenges involved. This investigation is confined to the simple case of parallel lamellae, as may be found in thin films. Our focus is on the structure and tension of interfaces between coexisting phases, in terms of the relative size of the long and short copolymers. As the blend approaches the critical point, which marks the disappearance of phase separation, the interfacial tension vanishes and the width diverges. When the short polymers are too small for periodic order to be stable in bulk, coexistence exists between long lamellae and disorder; and lamellar order is induced in the disordered phase, close to the interface.

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