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Scaling of Diblock Copolymer Lamella near the Order Disorder Transition ANDREW B. CROLL, AN-CHANG SHI, KARI DALNOKI-VERESS, McMaster University — Our accumulated knowledge of the physics of diblock copolymer phase transitions is extensive after decades of intense interest. There are, however, several inconsistencies between experiment and current theoretical understanding. Notably, one of the simplest measurable parameters, the length-scale of microphase separation, falls significantly out of agreement with theory near the order disorder transition (ODT). This length scales as $(\chi N)^m$ where χ is the Flory- Huggins interaction parameter and N is the number of monomers experiments yield $m = 0.8$ while theory predicts $m = 1$. We use optical microscopy to make real space measurements of the thickness of symmetric polystyrene - block - poly (2 vinyl pyridine), which we find to scale linearly - as predicted by theory. Our experiment suggests two simple optical methods for the measurement of χ .

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