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Spreading and breakup of a compound drop over a partially wetting substrate JAMES J. FENG, PENG GAO, University of British Columbia — The spreading of a encapsulated compound drop over a partially wetting solid substrate is numerically simulated using a diffuse-interface method. Compared with a single-phase drop, the spreading of a compound drop can exhibit much more complex behavior. Depending on the radius ratio and the contact angle, three flow regimes of interfacial morphology evolutions are identified. The core can remain suspended inside the outer drop or attaches onto the substrate if the outer interface does not rupture during the spreading. Otherwise, the compound drop spontaneously breaks up and releases the inner drop into the ambient fluid. A series of breakup scenarios are observed depending on the location of the initial rupture. In some regimes, the spreading and breakup can generate secondary drops, which can either attach to the substrate or stay away. The viscosity ratio mainly affects the spreading rate, and plays a secondary role in the morphology evolution.

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