

The structure of two-dimensional foams with finite contact angle

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ABSTRACT

We present Surface Evolver [1] computer simulations for the variation of the average coordination number Z of bubbles in a two-dimensional foam as a function of liquid fraction Φ for a range of finite contact angles between films and Plateau borders, using the method developed in [2]. In all cases we find a linear scaling of Z with liquid fraction for values of Φ below the critical value of 0.16 (wet limit), thus corroborating previous data obtained for the case of zero contact angle. This linearity is in contrast with the square root scaling found in the soft-disk model that is often used to model foams. Our results establish the importance of attractive bubble interactions for two-dimensional foams.

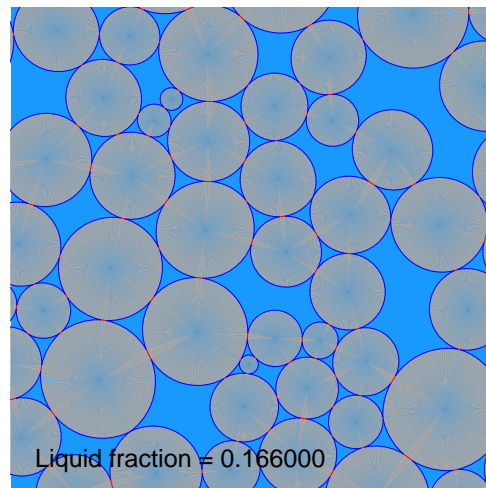


Figure 1: Example of a simulated foam with contact angle 5° .

[1] K. Brakke. The Surface Evolver, *Exp. Math.* 1:141-152, 1992.

[2] S.J. Cox, A.M. Kraynik, D. Weaire, S. Hutzler, Ideal wet two-dimensional foams and emulsions with finite contact angle, *Soft Matter*, 14:5922-5929, 2018.