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Contact Angle: Consequence of minimized Casimir Energy SUDDARSUN SHIVAKUMAR, Southern IL Univ-Carbondale — In 1805, T. Young, in his classic work, expressed the cosine of the angle subtended by the surface of a liquid droplet on a solid surface in terms of the surface energies of the respective mediums-solid, liquid and gas. More recently, London derived the van der Waals interaction energy using the then recent advent of quantum mechanics. Later, in 1937, H. C. Hamaker attempted to derive the interaction energies between two interacting mediums in contact. But, the van der Waals interaction energies for two bodies diverges as the bodies come in contact. To circumvent this undesired divergence, Hamaker introduced a cut-off distance parameter in his analysis, which typically is argued to be of atomic length. All future work on contact angles, since Hamaker, to our knowledge, has never been discussed without relying on this cut-off parameter. We here show that the contact angle is independent of the cut-off parameter, and free of divergence. Thus, contact angle is a measurable physical quantity.

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