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Oscillating dynamics of a bubble immersed in an electrical fie HERVE CAPS, JEROME HARDOUIN, GRASP-University of Liège, Belgium, GRASP TEAM — From the pioneer work of Millikan, it is known that adding electrical charges in a droplet causes both volume and surface forces. The first force allowed Millikan to determine the electrical charge of the electron, while Taylor paved the way into the second effect by evidencing capillary pressure variations. In the present study, we focus on the dynamics of a hemispheric bubble (1cm in diameter) deposed onto one of the two conducting plates of a capacitor. The bubble is observed to experience periodic electrical breakdowns followed by more quite periods. One of the important facts is that the bubble never explodes even electrical sparks are generated. The bubble dynamics has been followed by mean of a high-speed camera and allowed us to grasp the deformations of the bubble due to the electric field, from rest to the electrical breakdown. We propose a rather simple model accounting for the experimental parameters such as the applied electric field. By balancing the surface tension, viscous and electrical forces, this model mimics the bubble dynamics and evidences the charge dynamics inside the bubble.

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