

The Inner Structure of a Floating Water Bridge

When high voltage is applied to distilled water filled into two beakers close to each other, a water connection forms spontaneously, giving the impression of a floating water bridge (Fuchs *et al.* 2007 J. Phys. D: Appl. Phys. **40** 6112-4, 2008 J. Phys. D: Appl. Phys. *41* 185502, Woisetschläger *et al.* 2009 Exp. Fluids (submitted)). This phenomenon is of special interest, since it comprises a number of phenomena currently tackled in modern water science. The first data on neutron scattering of a floating heavy water bridge and the preliminary results of inelastic UV scattering seem to support the 'bubble hypothesis' suggested earlier (Fuchs *et al.* 2009, J. Phys. D: Appl. Phys **42** 2009 065502). These measurements can be interpreted in accordance with the presence of electrically induced cavitation nano bubbles. The quantum field theory prediction of coherent domains (Del Giudice, Vitiello, *personal communication* 2008) cannot be excluded either, since such domains would reveal similar neutron scattering characteristics. However, since both nano bubbles and coherent domains are said to carry charge, an electrostatic mesoscopic network formed by either of them can be held directly responsible for the stability of the bridge and may thus explain one key feature of the phenomenon.

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