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Investigation and Characterisation of Resizeable Nanopores in an Elastomeric Membrane GEOFF WILLMOTT, Industrial Research Limited — Experimental and theoretical work relating to the development of resizeable synthetic nanopores will be presented. The nanopores, which are roughly conical, are formed by puncturing a relatively thick ($\sim$250 μm) elastomeric membrane with an STM tip. The aperture can be closed and the size can be dynamically controlled by stretching the elastomer [1]. Use of this technology presents a collection of interesting physical problems, covering topics that include the failure and mechanical properties of the elastomer, flow of ionic current through the aperture and particle sensing using the resistive pulse technique. Synthetic nanopores have potential applications in many fields, but especially relating to nanoscale sensing and diagnostic devices, and replication of ion channels in living cells. [1] S. J. Sowerby, M. F. Broom, G. B. Petersen, Dynamically Resizable Nanometre-Scale Apertures for Molecular Sensing, Sensors and Actuators B: Chemical 123 (1), pp. 325-330 (2007)

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