Abstract Submitted
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Microfluidic bubble logic[1] MANU PRAKASH, NEIL GERSHENFELD, MIT — We present a new all-fluidic logic family based on two-phase flow in microscale geometries. Hydrodynamic interactions are exploited as a primary mechanism to introduce nonlinearity. Presence or absence of a bubble represents a bit. A bubble can thus carry both information and a material payload at the same time. Microfluidic bubble logic gates (AND/OR/NOT), memory and cascaded boolean circuits will be presented. Applications of such a control scheme to large-scale integrated bio-chemical processors will be highlighted.

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