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Optimal Dynamics of Intermittent Water Supply ANNA LIEB, JON WILKENING, University of California, Berkeley, CHRIS RYCROFT, Harvard University — In many urban areas of the developing world, piped water is supplied only intermittently, as valves direct water to different parts of the water distribution system at different times. The flow is transient, and may transition between free-surface and pressurized, resulting in complex dynamical features with important consequences for water suppliers and users. These consequences include degradation of distribution system components, compromised water quality, and inequitable water availability. The goal of this work is to model the important dynamics and identify operating conditions that mitigate certain negative effects of intermittent water supply. Specifically, we will look at valve parameters occurring as boundary conditions in a network model of transient, transition flow through closed pipes. Optimization will be used to find boundary values to minimize pressure gradients and ensure equitable water availability.

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