Repulsive Synchronization in an Array of Phase Oscillators LEV TSIMRING, NIKOLAI RULKOV, University of California, San Diego, MICHAEL LARSEN, MICHAEL GABBAY, Information Systems Laboratories, Inc. — We study the dynamics of an array of phase oscillators with repulsive coupling. Globally-coupled network of identical oscillators settles on one of a family of synchronized regimes characterized by zero mean field. However, variations of oscillator natural frequencies destroy synchronization for sufficiently large number of coupled oscillators independently of the coupling strength. In locally coupled networks (with a finite range of coupling less than the system size), the synchronization occurs even for non-identical oscillators when coupling is sufficiently strong. In the synchronized regime, a ring of repulsively coupled oscillators approaches linear phase distribution.