1068-90-87 **Fatma Kilinc-Karzan***, 765 Ferst Drive NW, Atlanta, GA 30332, and **Arkadi Nemirovski** and **Anatoli Juditsky**. ℓ_1 *Minimization via Randomized First Order Algorithms.*

We propose a randomized first-order algorithm to solve bilinear saddle points problems. Our developments are motivated by the need for sublinear time algorithms to solve large-scale parametric bilinear saddle point problems where cheap online assessment of solution quality is crucial. We present the theoretical efficiency estimate of our algorithm and discuss a number of applications, primarily to the problem of ℓ_1 minimization arising in sparsity-oriented signal processing. We demonstrate both theoretically and numerically, that when seeking medium-accuracy solutions of large-scale ℓ_1 minimization problems, our randomized algorithm outperforms significantly (and progressively as the sizes of the problem grow) the state-of-the art deterministic methods. (Received January 13, 2011)