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**Dan Bates** and **Frank Sottile\*** ([sottile@math.tamu.edu](mailto:sottile@math.tamu.edu)), Department of Mathematics, Mailstop 3368, Texas A&M University, College Station, TX 77843. *Khovanskii-Rolle continuation for real solutions*. Preliminary report.

Continuation methods are numerical algorithms which find all solutions to a system of polynomials by numerically tracing curves. Well-known are homotopy methods, where the curves arise from degenerations of the system, connecting solutions to the original system to those for simpler systems.

With Dan Bates, we propose a different method which is based on Khovanskii's generalization of Rolle's theorem and the notion of Gale duality for polynomial systems. Unlike homotopy continuation, this algorithm only finds real-number solutions and its complexity depends only on the number of real solutions, and not on the algebraic degree of the equations.

In this talk, I will sketch the main ideas in this new algorithm and show how it works in an implementation that we have made which is restricted to Gale-dual systems in the plane. (Received September 15, 2008)