1067-49-224   **Jonathan M Borwein*** (`jon.borwein@gmail.com`) and **Brailey Sims**. *Douglas-Ratchford iterations in the absence of convexity.*

The Douglas-Rachford iteration scheme, introduced half a century ago in connection with nonlinear heat flow problems, aims to find a point common to two or more closed constraint sets.

   Convergence is ensured when the sets are convex subsets of a Hilbert space.

   However, despite the absence of satisfactory theoretical justification, the scheme has been routinely used to successfully solve a diversity of practical optimization or feasibility problems in which one or more of the constraints involved is non-convex. As a first step toward addressing this deficiency, we provide convergence results for a proto-typical non-convex scenario.

   This is joint work with Brailey Sims which is to appear in *Fixed-Point Algorithms for Inverse Problems in Science and Engineering* in the *Springer Optimization and Its Applications* series. A preliminary version is available at `http://www.carma.newcastle.edu.au/~jb616/dr.pdf`. (Received August 09, 2010)