

Referee Report on the manuscript
“The Douglas-Rachford algorithm in the absence of convexity”
(dated March 29, 2010) by Jonathan M. Borwein and Brailey Sims

The following points need to be addressed in a revised version.

1. Page 8, last paragraph: In general, $S \cap L$ is only a *subset* of the set of fixed points of $T_{S,L}$. While in your setting it is clear that here $S \cap L$ is unique in the positive open halfspace, it is not clear to me why the set of fixed points of $T_{S,L}$ is unique there. So I don't see why you can speak of an “isolated fixed point of $T_{S,L}$ ” without further justification.
2. Page 15, top: In the proof, replace “ $> \alpha - 1$ as $x_n(2) < \rho_n$ ” by “ $\geq \alpha - 1$ as $x_n(2) \leq \rho_n$ ”? Because $x_n(2) = \rho_n$ seems perfectly possible?
3. Page 17, Remark 5: I do not think that the extension of your results from a line to a general finite-dimensional affine subspace is routine. If you claim the results, please provide proofs; otherwise, please formulate as conjectures.
4. Update Reference [9].