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Irving Dai* (ifdai@college.harvard.edu), 64 Linnaean St., 237 Currier Mail Center, Cambridge, MA 02138, **Xavier Garcia** (garci363@umn.edu), Minneapolis, MN 55455-0213, **Tudor Padurariu** (tudor_pad@yahoo.com), 540 Kelton Ave., Apt. 204, Los Angeles, CA 90024, and **Cesar E Silva** (csilva@williams.edu), Department of Mathematics and Statistics, 18 Hoxsey Street, Williamstown, MA 01267. *On Rationally Ergodic and Rationally Weakly Mixing Rank-One Transformations.*

We study the notions of weak rational ergodicity and rational weak mixing as defined by Jon Aaronson for infinite measure-preserving transformations. We partially characterize the families of rank-one transformations which possess (or do not possess) these properties, based on the construction of the transformations. We also consider the relation between rational weak mixing and other notions of mixing in infinite measure; to this end, we prove rational weak mixing implies double ergodicity and is independent of zero-type. (Received September 25, 2012)