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**Isaac Loh** and **Cesar E Silva\*** ([csilva@williams.edu](mailto:csilva@williams.edu)). *On conditions implied by ergodic cartesian square for nonsingular ergodic actions.*

We study conditions weaker than ergodic cartesian square for nonsingular transformations and actions such as weak double ergodic and ergodic with isometric coefficients. We give examples of rank-one transformations that are weak doubly ergodic and rigid (so all their cartesian products are conservative), but their 2-fold cartesian product is not ergodic. We also show that a weak doubly ergodic nonsingular group action is ergodic with isometric coefficients, and consider other examples. (Received September 20, 2016)