1046-22-1994 **Jon W. Short*** (jon@shsu.edu), Mathematics and Statistics, Box 2206, Sam Houston State University, Huntsville, TX 77341, and **T. Christine Stevens** (stevensc@slu.edu), Dept. of Mathematics and Computer Science, Saint Louis Univ, Ritter Hall 104, 220 N. Grand Blvd, St. Louis, MO 63103. *Topologies that are defined by forcing sequences of real numbers to converge to zero.* Preliminary report.

We consider metrizable topologies for the real numbers $\mathbb{R}$ that are defined by choosing a non-decreasing sequence of positive real numbers and specifying a rate at which that sequence will converge to zero. The resulting topologies are always weaker than the usual topology for $\mathbb{R}$. Building upon a previous paper [*Weakened Lie groups and their locally isometric completions*, Topology Appl. 135 (2004), 47-61], we show that very different sequences will yield topologies that are locally isometric, provided the "rate sequence" is the same. Since the local isometry is not, in general, a local homomorphism, the resulting topologies can have different global properties, which we investigate. Our results have applications in the study of Lie groups of transformations, which involves the investigation of topologies for Lie groups that are weaker than the usual topology. (Received September 17, 2008)