1014-22-1636 **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 University, Ritter Hall 104, 220 N. Grand Blvd., St. Louis, MO 63103. *When do locally isometric topologies for the real numbers yield isomorphic topological groups?* Preliminary report.

In a previous paper, the authors showed that a large class of metrizable topologies for the real numbers are locally isometric [*Weakened Lie groups and their locally isometric completions*, Topology Appl. 135 (2004), 47-61]. The metrics in question are defined by specifying a sequence of real numbers and the rate at which it converges to zero, and the corresponding topologies are always weaker than the usual topology for the real numbers $\mathbb{R}$. Under rather mild restrictions on the sequences and the rate at which they converge to zero, two very different sequences will yield metrics ν and μ that make $(\mathbb{R}, \nu)$ and $(\mathbb{R}, \mu)$ locally isometric, and the completions of these groups will also be locally isometric. Since the local isometry is not, in general, a local homomorphism, the question of whether $(\mathbb{R}, \nu)$ and $(\mathbb{R}, \mu)$ are isomorphic as topological groups remains open. In the current paper we explore the conditions that determine whether such an isomorphism exists. Our results have applications to the larger problem of determining the ways in which the topology of an arbitrary connected Lie group can be weakened, while remaining a Hausdorff topological group. (Received September 29, 2005)