

# COMPACT LIMIT SPACES OF NIL-MANIFOLDS WITH CURVATURE BOUNDED BELOW

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## ABSTRACT

Let  $X$  be a compact Gromove-Hausdorff limit space of a sequence of  $n$ -manifolds,  $M_i$ , of sectional curvature  $\sec_{M_i} \geq -1$ , or Ricci curvature  $\text{Ric}_{M_i} \geq -(n-1)$  and all points in  $M_i$  satisfy a local rewinding Reifenberg condition, respectively. We will report a recent work: if  $M_i$  is homeomorphic, or diffeomorphic to a nil-manifold, respectively, then  $X$  is homeomorphic to, or diffeomorphic to a nil-manifold, respectively. As an application, we generalize a recent result by Buré-Naber-Semola that a compact GH-limit of a sequence of  $M_i$  homeomorphic to a torus of  $\sec_{M_i} \geq -1$  is a homeomorphic to torus.