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Singularity of Two-Step Nilpotent Lie Algebras Constructed from Graphs. Preliminary report.

We start by introducing two methods for constructing a two-step nilpotent metric Lie algebra, one from a simple graph and one from a directed edge-labelled graph where the edge labels may repeat. Previous results about the singularity of Lie algebras for the simple graph construction will be briefly discussed. When introducing repeated edge labels in the construction, the Euclidean deRham (or Abelian) factor becomes a consideration. We will focus on certain classes of graphs and discuss how the Euclidean deRham factor and singularity of these Lie algebras may be determined by properties of the graphs. (Received September 16, 2019)