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# AN ANGLE METRIC THROUGH THE NOTION OF GRASSMANN REPRESENTATIVE*

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**Abstract.** The present paper has two main goals. Firstly, to introduce different metric topologies on the pencils $(F, G)$ associated with autonomous singular (or regular) linear differential or difference systems. Secondly, to establish a new angle metric which is described by decomposable multi-vectors called Grassmann representatives (or Plücker coordinates) of the corresponding subspaces. A unified framework is provided by connecting the new results to known ones, thus aiding in the deeper understanding of various structural aspects of matrix pencils in system theory.

**Key words.** Angle metric, Grassmann manifold, Grassmann representative, Plücker coordinates, Exterior algebra.

**AMS subject classifications.** 15A75, 15A72, 32F45, 14M15.

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