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An algorithm for providing the normal forms of spatial quasi-homogeneous polynomial differential systems

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ABSTRACT

Quasi-homogeneous systems, and in particular those 3-dimensional, are currently a thriving line of research. But a method for obtaining all fields of this class is not yet available. The weight vectors of a quasi-homogeneous system are grouped into families. We found the maximal spatial quasi-homogeneous systems with the property of having only one family with minimum weight vector. This minimum vector is unique to the system, thus acting as identification code. We develop an algorithm that provides all normal forms of maximal 3-dimensional quasi-homogeneous systems for a given degree. All other 3-dimensional quasi-homogeneous systems can be trivially deduced from these maximal systems. We also list all the systems of this type of degree 2 using the algorithm. With this algorithm we make available to the researchers all 3-dimensional quasi-homogeneous systems.

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