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Resonance Sequence and Focal Decompositions

Opis: Let $\alpha = \{\alpha_1, \dots, \alpha_k\}$ be a finite multiset of non-negative real numbers. Consider the sequence of all positive integer multiples of all α_i 's, and note the multiplicity of each term in this sequence. This sequence of multiplicities is the resonance sequence generated by $\{\alpha_1, \dots, \alpha_k\}$. Two multisets are combinatorially equivalent if they generate the same resonance sequence. The paper is devoted to the classification of multisets up to combinatorial equivalence. We show that the problem of combinatorial equivalence of multisets is closely related to the problem of classification of systems of second order ordinary differential equations up to focal equivalence.