

Classification of Tropical Semi-Modules

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Abstract : Tropical algebra is the algebra constructed over an idempotent semifield S . We show here that every m -dimensional tropical module M over S with strongly independent basis can be embedded into S^m , and provide an algebraic invariant -the Γ -matrix of M - which characterises the isomorphy class of M . The strong independence condition also yields a significant improvement to the Whitney embedding for tropical torsion modules published earlier. We also show that the strong independence of the basis of M is equivalent to the unique representation of elements of M . Numerous examples illustrate our results.

Keywords : classification, idempotent semi-modules, strong independence, tropical algebra

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