

# Real stability of spanning tree enumerator

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**Abstract.** Kruskal's theorem states that a sum of product tensors constitutes a unique tensor rank decomposition if the so-called  $k$ -ranks of the product tensors are large. We prove a more general result in which the  $k$ -rank condition of Kruskal's theorem is weakened to the standard notion of rank, and the conclusion is relaxed to a statement on the linear dependence of the product tensors. As a corollary, we prove that if  $n$  product tensors form a circuit, then they have rank greater than one in at most  $n - 2$  subsystems. This generalizes several recent results in this direction, and is sharp. The proof of the main result is based on the matroid ear decomposition technique.

## References

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