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On The Stability of Tensor Product Representations of Classical Groups

From an irreducible representation of $\mathrm{GL}(n,\mathbb{C})$ there is a natural way to construct an irreducible representations of $\mathrm{GL}(n+1,\mathbb{C})$ by adding a zero at the end of the highest weight $\underline{\lambda} = (\lambda_1 \geq \lambda_2 \geq \cdots \geq \lambda_n)$ with $\lambda_i \geq 0$ of the irreducible representation of $\mathrm{GL}(n,\mathbb{C})$. The paper considers the decomposition of tensor products of irreducible representation of $\mathrm{GL}(n,\mathbb{C})$ and of the corresponding irreducible representations of $\mathrm{GL}(n+1,\mathbb{C})$ and proves a stability result about such tensor products. We go on to discuss similar questions for classical groups.

Keywords: Classical groups, tensor product, Pieri's rule, Littlewood-Richardson rule, Weyl character formula.

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