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Tensor invariants, saturation problems, and Dynkin automorphisms

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Let G be a connected almost simple algebraic group with a Dynkin automorphism σ. Let G_σ be the connected almost simple algebraic group associated to G and σ. We prove that the dimension of the tensor invariant space of G_σ is equal to the trace of σ on the corresponding tensor invariant space of G. We prove that if G has the saturation property then so does G_σ. As a consequence, we show that the spin group $\mathrm{Spin}(2n+1)$ is of saturation property with factor 2, which strengthens the results of Belkale—Kumar and Sam in the case of type B_n.

Joint work with Linhui Shen.

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