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Modular reduction of the Steinberg representation of the general linear group

Shortly after Chevalley constructed his groups of Lie type in a uniform manner, Steinberg did the same for his representation. In characteristic 0 it is always irreducible and realizable over \mathbb{Z} . Reduction modulo a prime different from the defining characteristic need no longer be irreducible and, in fact, may be quite far from being so.

In the present talk we will examine the case of the general linear group $GL_n(q)$ with the aim of finding of finding a composition series for St when reduced modulo a prime ℓ that does not divide q .

It is conjectured that a natural filtration for this reduction, namely its Jantzen's filtration, is actually a composition series. Our presentation will focus on recent progress regarding this conjecture.