MONODROMY OF GALOIS REPRESENTATIONS AND EQUAL-RANK SUBALGEBRA EQUIVALENCE

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ABSTRACT. Let G_ℓ denote the ℓ-adic monodromy of a compatible system of semisimple Galois representations of a number field. Let $\mathfrak{g}_\ell$ denote the complexified Lie algebra of the reductive G_ℓ. Serre proved that the rank of $\mathfrak{g}_\ell$ is independent of ℓ. We prove that the dimension of the center of $\mathfrak{g}_\ell$ is independent of ℓ and the semisimple parts of all $\mathfrak{g}_\ell$ satisfy an equivalence relation. In particular, the number of $A_n := \mathfrak{sl}_{n+1,\mathbb{C}}$ simple factors of $\mathfrak{g}_\ell$ is independent of ℓ if $n \in \{6, 9, 10, 11, 12, ...\}$.

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