

Cohomological purity of affine Springer fibers

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Abstract : The affine Springer fibers have been used by Goresky, Kottwitz, and Macpherson to prove the fundamental lemma of Langlands-Shelstad in the unramified case, under the hypothesis that they are cohomologically pure in the sense of Deligne. They have also proven the conjecture in the equivalued case. But beyond that, the conjecture remains a mystery, even after the proof of the fundamental lemma by Ngo. In my talk, I will explain how to construct an affine paving of the unramified affine Springer fibers for GL_4 . If the time permits, I will explain a conjectural combinatorial approach to construct affine pavings in general.