

THE WEIGHT-MONODROMY CONJECTURE AND LOCAL INVARIANT CYCLES

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ABSTRACT. We introduce the weight-monodromy conjecture in the l -adic setting. It makes a statement about the weights of the $\text{Gal}(K^{\text{sep}}/K)$ -representation on the l -adic cohomology groups $H^i(X_{K^{\text{sep}}}, \mathbb{Q}_l)$ of a smooth proper K -variety X , where K is the fraction field of an Henselian discrete valuation ring \mathcal{O}_K with finite residue field which has characteristic not equal to l . This was first conjectured by Deligne in the 70's and can be seen as a generalization of the Riemann hypothesis part of the Weil conjectures. We further show that in mixed characteristic the weight-monodromy conjecture implies the so called local invariant cycle conjecture. This is an l -adic analogue of the local invariant cycle theorem from complex analysis.