

On trivial zeros of Perrin-Riou's L -functions

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Let V be a pseudo-geometric representation of $\text{Gal}(\bar{\mathbb{Q}}/\mathbb{Q})$. Suppose that the Euler factor $E_p(V, s)$ of V at p vanishes at $s = 0$ or 1 . If V is ordinary at p , Greenberg defined an ℓ -invariant $\ell(V)$ in terms of Galois cohomology and conjectured that it appears as an additional factor in the formula relating special values of the complex and the p -adic L -function of V .

Using the theory of (φ, Γ) -modules we define an $\ell(V)$ -invariant for representations which are semi-stable at p .

Next we show that in the crystalline case this invariant appears as an additional factor in the Bloch-Kato type formula for special values of Perrin-Riou's Iwasawa L -function $L_{\text{Iw}}(V, s)$.