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Overconvergent p -adic representations. (Représentations p -adiques surconvergentes.)
(French) [Zbl 0928.11051](#)
Invent. Math. 133, No. 3, 581-611 (1998).

Let K be a local p -adic field, \mathcal{G}_K its absolute Galois group, J.-M. Fontaine's theory of (φ, Γ) -modules associates to each p -adic representation V of \mathcal{G}_K a module $D(V)$ over a certain local field of dimension 2, with natural and commuting actions of the Frobenius φ and the Galois group $\Gamma = \text{Gal}(K(\mu_{p^\infty})/K)$.

The main point is that, starting from $D(V)$, one can reconstruct the representation V , and one hopes to describe in this way all the classical invariants of V , for instance its Galois cohomology (Laurent Herr's thesis, 1995) [see *L. Herr*, *Bull. Soc. Math. Fr.* 126, 563–600 (1998; [Zbl 0967.11050](#))].

In this paper, the authors show that any p -adic representation of \mathcal{G}_K is “overconvergent”. This notion, introduced in the first author's thesis (1996), is too technical to be recalled here, but it is the essential tool which allows to recover from $D(V)$ the more subtle invariants of V built upon the rings B_{cris} , B_{dR} etc.

The proof, using the action of Γ , is inspired from Shankar Sen's proof that any p -adic representation of \mathcal{G}_K has a generalized Hodge-Tate decomposition [*Invent. Math.* 62, 89–116 (1980; [Zbl 0463.12005](#))], but of course, it must overcome technical difficulties which appear because the rings involved are more complicated than \mathbb{C}_n .

In another paper [“Théorie d'Iwasawa des représentations p -adiques d'un corps local”, *J. Am. Math. Soc.* 12, 241–268 (1999; [Zbl 0933.11056](#))] the authors have given applications to Iwasawa theory of local fields and explicit reciprocity laws.

Reviewer: [Thong Nguyen Quang Do \(Besançon\)](#)

MSC:

[11S20](#) Galois theory
[14F30](#) p -adic cohomology, crystalline cohomology
[11S25](#) Galois cohomology

Cited in **5** Reviews
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