Huyghe, Christine

Geometric interpretation on the projective space of coherent $A_N(K)^\dagger$-modules. (Interprétation géométrique sur l'espace projectif des $A_N(K)^\dagger$-modules cohérents.) (French)

Zbl 0872.14010
C. R. Acad. Sci., Paris, Sér. I 321, No. 5, 587-590 (1995).

Let $\mathcal{V}$ be a complete discrete valuation ring of unequal characteristics $(0, p)$, K its fraction field and X (resp. $\mathcal{X}$) the projective (resp. the formal projective) space over $\mathcal{V}$. In this note, the author proves that the global sections of the sheaf $\mathcal{D}^\dagger_{\mathcal{X},\mathbf{Q}}(\infty)$ of differential operators with overconvergent singularities at infinity, defined by *P. Berthelot* in Ann. Sci. Éc. Norm. Supér., IV. Sér. 29, No. 2, 185-272 (1996), coincide with the weak completion $A_N(K)^\dagger$ of the Weyl algebra, i.e. the sections over the affine space of the sheaf $\mathcal{D}^\dagger_{X^\dagger} \otimes \mathbb{Q}$ introduced by *Z. Mebkhout* and *L. Narváez-Macarro* Notes Math. 1454, 267-308 (1990; Zbl 0727.14011), where $X^\dagger$ is the weak completion of X. As a consequence, she obtains an equivalence between the category of coherent $A_N(K)^\dagger$-modules and the category of coherent $\mathcal{D}^\dagger_{\mathcal{X},\mathbf{Q}}(\infty)$-modules.

[Reviewer's remark: the author calls the ring $R := \{\sum_{l,k} a_{l,k} x^l \partial_x^k / k! \mid \exists C, \eta < 1,\ a_{l,k} < C\eta^{l+k}\}$ "weak completion of the Weyl algebra". In the reviewer's opinion, it would be more appropriate to reserve this name for the ring $\{\sum_{l,k} a_{l,k} x^l \partial_x^k \quad \exists C, \eta < 1,\ a_{l,k} < C\eta^{l+k}\}$ and the ring R would be called "weak completion of the ring of differential operators"].

Reviewer: L.Narváez-Macarro (Sevilla)

MSC:

14F10 Differentials and other special sheaves; D-modules; Bernstein-Sato ideals and polynomials

Cited in **1** Review
Cited in **3** Documents

Keywords:

discrete valuation ring; differential operators with overconvergent singularities; formal scheme