On the perverse filtration of the moduli spaces of 1-dimensional sheaves on P2 and P=C conjecture

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Let $M(d,\chi)$ be the moduli space of semistable 1-dimensional sheaves supported at curves of degree d on $\p^2$, with Euler characteristic χ. We have the Hilbert-Chow morphism $\pi: M(d,\chi)--> |dH|$ sending each sheaf to its support. We study the perverse filtration on $H^*(M(d,\chi),\bq)$ via map π, especially the ``P=C'' conjecture posed by Kononov-Pi-Shen. We show that ``P=C'' conjecture holds for $H^{*\leq 4}(M(d,\chi),\bq)$ for any $d\geq 4$, $(d,\chi)=1$. In the talk we will introduce the set-up of the P=C conjecture and explain the main strategy of the proof which is to relate $M(d,\chi)$ to the Hilbert scheme $S^{[n]}$ of n-points and transfer the problem to some properties on $H^*(S^{[n]},\bq)$. We will omit the details of the concrete computations and refer to the paper arXiv 2312.17035 on arXiv.

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