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Hodge Numbers from Picard-Fuchs Equations

Given a variation of Hodge structure over \mathbb{P}^1 with Hodge numbers $(1, 1, \dots, 1)$, we show how to compute the degrees of the Deligne extension of its Hodge bundles, following Eskin-Kontsevich-Möller-Zorich, by using the local exponents of the corresponding Picard-Fuchs equation. This allows us to compute the Hodge numbers of Zucker's Hodge structure on the corresponding parabolic cohomology groups. We also apply this to families of elliptic curves, K3 surfaces and Calabi-Yau threefolds. This is joint work with Andrew Harder and Alan Thompson.