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Treball final de grau

GRAU DE MATEMÀTIQUES

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AQUI EL TÍTOL DEL TREBALL

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Contents

The main goal of this work is to prove the existence of.......

Notation: We will work over an algebraically closed field K of characteristic zero.

Chapter 1

títol del capítol 1

1.1 Sub apartat del capítol

Definition 1.1. Given a projective scheme $X \subseteq \mathbb{P}^n$ and a coherent sheaf $\mathcal{E}$ on X, we say that $\mathcal{E}$ is an *Ulrich sheaf* if $\mathcal{E}$ is an ACM sheaf and $\mathrm{h}^0(\mathcal{E}_{init}) = \deg(X)\mathrm{rank}(\mathcal{E})$, i.e. the minimal number of generators of Ulrich sheaves is as large as possible.

Notice that in Definition 1.1 we do not require......

Theorem 1.2. (Borel-Bott-Weil) *Assume that all entries of $\alpha + \rho$ are distinct. Let $\sigma \in S_{n+1}$ be the unique permutation such that $\sigma(\alpha + \rho)$ is strictly decreasing. Then*

$$\mathrm{H}^m(F_c, L_\alpha) = \begin{cases} \Sigma^{\sigma(\alpha+\rho)-\rho} V^* & \textit{if} \quad m = l(\sigma) \\ 0 & \textit{otherwise.} \end{cases}$$

If at least two entries of $\alpha + \rho$ coincide then

$$\mathrm{H}^i(F_c, L_\alpha) = 0 \quad \textit{for all integer } i.$$

Proof. See [3]; Theorem 2. □

Theorem 1.3. (Borel-Bott-Weil) *Let $\beta = (\beta_1, \cdots, \beta_{p+1}) \in \mathbb{Z}^{p+1}$, $\alpha = (\alpha_1, \cdots, \alpha_{q-p}) \in \mathbb{Z}^{q-p}$ and $\gamma = (\gamma_1, \cdots, \gamma_{n-q}) \in \mathbb{Z}^{n-q}$ be non-increasing integer sequences and let $\mu = (\beta, \alpha, \gamma) \in \mathbb{Z}^{n+1}$ be their concatenation.*

(a) Assume that all entries of $\mu + \rho$ are distinct and let $\sigma \in S_{n+1}$ be the unique permutation such that $\sigma(\mu + \rho)$ is strictly decreasing. Then

$$\mathrm{H}^m(F(p,q,n), \Sigma^\beta \mathcal{P} \otimes \Sigma^\alpha \mathcal{S}_2 \otimes \Sigma^\gamma \mathcal{S}_1) = \begin{cases} \Sigma^{\sigma(\mu+\rho)-\rho} V^* & \textit{if} \quad m = l(\sigma) \\ 0 & \textit{otherwise.} \end{cases}$$

(b) *If at least two entries of $\mu + \rho$ coincide then*

$$\mathrm{H}^i(F(p,q,n), \Sigma^{\beta}\mathcal{P} \otimes \Sigma^{\alpha}\mathcal{S}_2 \otimes \Sigma^{\gamma}\mathcal{S}_1) = 0 \quad \textit{for all interger } i.$$

Proof. It follows from Theorem 1.2 □

Chapter 2

títol del capítol 2

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