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$Xp, q \in X chain\ of\ analytic\ diskspq$

.$VK_V = \det(V^*)$
$V1^bK_V \det V^* T_X{}^bK_V$

$\mathcal{L}_V \otimes \mathcal{J}_V \mathcal{J}_V \subset \mathcal{O}_X$
$\mu : \widetilde{X} \to X \widetilde{X} \widetilde{V} = \overline{\widetilde{\mu}^{-1}(V)}$
$\mu_*({}^bK_{\widetilde{V}})\mu$
.1

(X, V)
$\mu m \mu m$
$(X, V) H^0(X, K_V^{[m]}) X m \gg 1$
.$(X, V) K_V^\bullet \exists Y X \forall f : (C, T_C) \to (X, V) f(C) \subset Y.$
$r = rkV = 1V^* \exists A S^m V^* \otimes \mathcal{O}(-A) XY$
$\gamma = i \sum \gamma_{jk} dt_j \wedge d\bar{t}_k \geq 0 B(0, R) \subset C^p - Ricci(\gamma) := i\,\partial\overline{\partial} \log \det \gamma \geq C\gamma C > 0 \gamma$é
$\det(\gamma) \leq \Big(\frac{p+1}{CR^2}\Big)^p \frac{1}{(1-|t|^2/R^2)^{p+1}}.$
$R \leq \big(\frac{p+1}{C}\big)^{1/2} (\det(\gamma(0))^{-1/2p}$
.V
$\|\xi\|^2_{V,h} := \Big(\sum_j |\sigma_j(x) \cdot \xi^m|^2_{h_A^*}\Big)^{-1/m} \xi \in V_x \sigma_j \in H^0(X, S^m V^* \otimes \mathcal{O}(-A) \gamma(t) = i \|f'(t)\|^2_{V,h} dt \wedge d\bar{t} D(0, R) \gamma \not\equiv 0$

$RR = +\infty$
$\forall P \in H^0(X, E^{GG}_{k,m} V^* \otimes \mathcal{O}(-A)) X A \forall f : (C, T_C) \to (X, V) P(f_{[k]}) \equiv 0.$
.$f \|f'\|_\omega \omega X P A P C A$
$f^{(s)} u_A(t) = P(f_{[k]})(t)$
$A A \in |A| A f(C) \subset X u_A u_A \equiv 0$
$P \in H^0(X, E_{k,m} V^* \otimes \mathcal{O}(-A)) G_k \sigma \in H^0(X_k, \mathcal{O}_{X_k}(m) \otimes \pi^*_{k,0} \mathcal{O}(-A))$
.$\sigma \mathcal{O}_{X_k}(1) X_{k-1} h_\sigma \mathcal{O}_{X_k}(-1) |\xi^m \cdot \sigma|^{2/m} i\partial\overline{\partial} \log h_\sigma$ä$\omega X_k h_\sigma Z_\sigma$
$f_{[k-1]} : C \to X_{k-1} f'_{[k-1]} f^*_{[k]} \mathcal{O}_{X_k}(-1)$
$\gamma(t) = i\,\|f'_{[k-1]}\|^2_{h_\sigma} dt \wedge d\bar{t} f(C) \not\subset Z_\sigma \gamma \not\equiv 0 C$

$f(C) \subset Z_\sigma$
$P G_k (\varphi^* P)(f_{[k]}) := P((f \circ \varphi)_{[k]})(0)$

$\alpha = (\alpha_1, \ldots, \alpha_k) \in N^k \varphi^{(\alpha)} = (\varphi')^{\alpha_1} (\varphi'')^{\alpha_2} \ldots (\varphi^{(k)})^{\alpha_k} |\alpha|_w = \alpha_1 + 2\alpha_2 + \ldots + k\alpha_k \alpha P = m P_\alpha$
$\deg P_\alpha = m - (\alpha_2 + 2\alpha_3 + \ldots + (k-1)\alpha_k) = \alpha_1 + \alpha_2 + \ldots + \alpha_k.$
$(X, V)^b K_V 1 \exists P \in H^0(X, E_{k,m} V^* \otimes \mathcal{O}(-A)) m \gg k \gg 1 \Rightarrow \exists Z X_k f_{[k]}(C) \subset Z \forall f : (C, T_C) \to (X, V)$
$J_k V k f : (C, T_C) \to (X, V)$
$V h J^k V p = k!$
$\xi_s = \nabla^s f(0) h_k L_k := \mathcal{O}_{X_k^{GG}}(1)(x, \xi_1, \ldots, \xi_k) \mapsto$
$(c_{ij\alpha\beta}) \Theta_{V^*,h^*} \omega_{FS,k} X_k^{GG} \to X$

.

$\omega_{FS,k}(\xi) \xi \Theta_{V,h} u_s S V \subset V$
$\sum |\xi_s|^{2p/s} = 1 x_s \geq 0 \sum x_s = 1 \sum \frac{1}{s} \gamma(u_s) u_s k \to +\infty$

$\gamma \int_{u \in SV} \gamma(u)\, du = \frac{1}{r} Tr(\gamma)$
.$\Rightarrow \Theta_{V^*,h^*}(\det V^*, \det h^*) > 0 \det V^* (X, V) F \to X Q(V, h)(F, h_F)$

$$L_k = \mathcal{O}_{X_k^{GG}}(1) \otimes \pi_k^* \mathcal{O}\Big(\frac{1}{kr}\Big(1 + \frac{1}{2} + \ldots + \frac{1}{k}\Big) F\Big),$$

$$\eta = \Theta_{\det V^*, \det h^*} + \Theta_{F, h_F}.$$

$q \geq 0 m \gg k \gg 1 m q = 0$

$$h^q(X_k^{GG}, \mathcal{O}(L_k^{\otimes m})) \leq \frac{m^{n+kr-1}}{(n+kr-1)!} \frac{(\log k)^n}{n!\,(k!)^r} \Bigg(\int_{X(\eta,q)} (-1)^q \eta^n + \frac{C}{\log k}\Bigg)$$

$$h^q(X_k^{GG}, \mathcal{O}(L_k^{\otimes m})) \geq \frac{m^{n+kr-1}}{(n+kr-1)!} \frac{(\log k)^n}{n!\,(k!)^r} \Bigg(\int_{X(\eta,q,\,q\pm 1)} (-1)^q \eta^n - \frac{C}{\log k}\Bigg).$$

$Z k X, X k$