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Let $B_\epsilon(P_\alpha, P_\alpha)$ be a ball of radius ϵ around (P_α, P_α) in $M \times M$, and let ρ_α be a bump function with

$$\rho_\alpha \equiv 1 \quad \text{in } B_\epsilon(P_\alpha, P_\alpha)$$
$$\rho_\alpha \equiv 0 \quad \text{in } M \times M - B_{2\epsilon}(P_\alpha, P_\alpha);$$

let k be the current on $M \times M$ given by

$$k = \sum_\alpha \rho_\alpha \cdot k(z_\alpha, \zeta_\alpha),$$

where $k(z_\alpha, \zeta_\alpha)$ is the Bochner-Martinelli kernel. Then in $B_\epsilon(P_\alpha, P_\alpha)$ we have

$$\bar\partial k = \bar\partial k(z_\alpha, \zeta_\alpha) = T_\Delta^0.$$

Comment on " homotopy formula is equivalat to the distributional equation $\bar\partial k = T_\Delta^0$."

According to P384, $\psi \in A_c^{n,n-q}(\mathbb{C}^n)$, $\varphi \in A_c^{0,q}(\mathbb{C}^n)$

$$\int_{\mathbb{C}^n\times\mathbb{C}^n-\Delta} d(k(z,\omega) \wedge \psi(z) \wedge \varphi(\omega)) = \int_{\mathbb{C}^n\times\mathbb{C}^n-\Delta} \bar\partial(k \wedge \psi \wedge \varphi)$$

$$\circledast$$

$$= -\int_{\mathbb{C}^n\times\mathbb{C}^n-\Delta} k \wedge \bar\partial(\psi\wedge\varphi) = -\int_{\mathbb{C}^n\times\mathbb{C}^n-\Delta} k \wedge \bar\partial\psi \wedge \varphi - (-1)^q \int_{\mathbb{C}^n\times\mathbb{C}^n-\Delta} k \wedge \psi \wedge \bar\partial\varphi$$

$$= -(-1)^{(2n-1)(2n-q+1)} \int_{\mathbb{C}^n\times\mathbb{C}^n-\Delta} \bar\partial\psi(z) \wedge k(z,\omega) \wedge \varphi(\omega)$$

$$+ (-1)^{q+1} (-1)^{(2n-1)(2n-q)} \int_{\mathbb{C}^n\times\mathbb{C}^n-\Delta} \psi \wedge k(z,\omega) \wedge \bar\partial\varphi$$

$$= (-1)^q \int_{\mathbb{C}^n\times\mathbb{C}^n-\Delta} \bar\partial\psi(z) \wedge k(z,\omega) \wedge \varphi(\omega) + (-1) \int_{\mathbb{C}^n\times\mathbb{C}^n-\Delta} \psi \wedge k(z,\omega) \wedge \bar\partial\varphi$$

$$= (-1)^q \int_{\mathbb{C}^n\times\mathbb{C}^n} \bar\partial\psi(z) \wedge k(z,\omega) \wedge \varphi(\omega) + (-1) \int_{\mathbb{C}^n\times\mathbb{C}^n} \psi(z) \wedge k(z,\omega) \wedge \bar\partial\varphi(\omega)$$

since $k(z,\omega)$ is locally integrable.

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