out to be useful in proving the holomorphic Lefschetz fixed-point formula.

Some notation will be helpful in defining K. Given complex manifolds M and N with local holomorphic coordinates z and w, the forms on the product $M \times N$ decompose into bitype, where, e.g.,

$$A^{(p,q)(r,s)}(M \times N)$$

denotes the C^∞ forms having type (p, q) in dz's and (r, s) in dw's, and therefore type $(p+r, q+s)$ on $M \times N$. We set

$$\Phi(\zeta) = d\zeta_1 \wedge \cdots \wedge d\zeta_n,$$
$$\Phi_i(\zeta) = (-1)^{i-1} \zeta_i \, d\zeta_1 \wedge \cdots \wedge \widehat{d\zeta_i} \wedge \cdots \wedge d\zeta_n,$$

and define the Bochner-Martinelli kernel on $\mathbb{C}^n \times \mathbb{C}^n$ by

$$k(z, w) = C_n \frac{\sum \overline{\Phi_i(z-w)} \wedge \Phi(w)}{\|z-w\|^{2n}}.$$

This form has singularities along the diagonal $z = w$, and is integrable on $\mathbb{C}^n \times \mathbb{C}^n$.

I think $k(z, w)$ is locally integrable on $\mathbb{C}^n \times \mathbb{C}^n$ in the following sense.

$$\int \sqrt{\langle k(z,w), k(z,w) \rangle} \, dz \wedge d\bar{z} \wedge dw \wedge d\bar{w} < \infty$$

Let's compute if the integral is finite or not.