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Holomorphic tangent space of a complex manifold

The holomorphic tangent space of a complex manifold is the subspace

$$T_p^{\mathbb{C}}M \leq \operatorname{Hom}\operatorname{Vec}_{\mathbb{C}}(\mathcal{C}^h(M,\mathbb{C}),\mathbb{C})$$

containing the operators

$$(-\circ \mathfrak{r})'(0)$$

for any holomorphic map $\mathfrak{r}:D^2\subset\mathbb{C}\rightarrow M,\mathfrak{r}(0)=p$

local basis

Given a local chart (U,ϕ) around p , we have a local basis

$$\frac{\partial}{\partial z_i}$$

whose $\mathbb{C}$ -span is the holomorphic tangent space.

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