dy checked.

As a consequence, if one thinks matters through, the following conclusion emerges: Given coherent sheaves $\mathcal{F}$ and $\mathcal{G}$, we may define sheaves $\underline{Ext}_{\mathcal{O}}^{k}(\mathcal{F}, \mathcal{G})$ and $\underline{Tor}_{k}^{\mathcal{O}}(\mathcal{F}, \mathcal{G})$ with the properties:

1. $\begin{cases} \underline{Ext}_{\mathcal{O}}^{k}(\mathcal{F}, \mathcal{G})_x \cong Ext_{\mathcal{O}_x}^{k}(\mathcal{F}_x, \mathcal{G}_x), \\ Tor_{k}^{\mathcal{O}}(\mathcal{F}, \mathcal{G})_x \cong Tor_{k}^{\mathcal{O}_x}(\mathcal{F}_x, \mathcal{G}_x); \end{cases}$

2. $\begin{cases} \underline{Ext}_{\mathcal{O}}^{0}(\mathcal{F}, \mathcal{G}) \cong \underline{Hom}_{\mathcal{O}}(\mathcal{F}, \mathcal{G}), \\ \underline{Tor}_{0}^{\mathcal{O}}(\mathcal{F}, \mathcal{G}) \cong \mathcal{F} \otimes_{\mathcal{O}} \mathcal{G} \end{cases}$

3. The exact sequences of $\underline{Ext}$ and $\underline{Tor}$ are valid; and

4. $\underline{Ext}_{\mathcal{O}}^{*}(\mathcal{F}, \mathcal{G})$ and $Tor_{*}^{\mathcal{O}}(\mathcal{F}, \mathcal{G})$ are coherent sheaves.

The last property is because $\underline{Ext}$ and $\underline{Tor}$ fit into exact sequences where two out of three terms are coherent.

⌈ According to Theorem 14. P19. Introduction to holomorphic functions of several complex variables, vol III. by R. Gunning, i.e.,

Theorem 14. If $\mathcal{F}$ and $\mathcal{G}$ are coherent holomorphic sheaves over a holomorphic variety V, then the image and kernel of any sheaf morphism $\phi : \mathcal{F} \longrightarrow \mathcal{G}$ are also coherent.

Since $\mathcal{F}$ & $\mathcal{G}$ are coherent, then $Hom_{\mathcal{O}}(\mathcal{F}, \mathcal{O})$ is