⌈ From the exact sequence of sheaves above, we have the long exact sequence

$$H^0(M, \mathcal{H}om_{\mathcal{O}}(\mathcal{E}(-k), \mathcal{R})) \to H^0(M, \mathcal{H}om_{\mathcal{O}}(\mathcal{E}(-k), \mathcal{E})) \to H^0(M, \mathcal{H}om_{\mathcal{O}}(\mathcal{E}(-k), \mathcal{F}))$$

$$\to \underbrace{H^1(M, \mathcal{H}om_{\mathcal{O}}(\mathcal{E}'(-k), \mathcal{R}))}_{\overset{\parallel}{0}} \to$$

0 by the result above for $k \geq k_0$

$\Rightarrow \exists$ a surjection $H^0(M, \mathcal{H}om_{\mathcal{O}}(\mathcal{E}'(-k), \mathcal{E})) \to H^0(M, \mathcal{H}om_{\mathcal{O}}(\mathcal{E}(-k), \mathcal{F}))$

$\Rightarrow$ This implies that in the diagram the dotted arrow is filled. ⌋

From this we may draw the following conclusion: When working globally with coherent sheaves on M, the four properties of projective resolutions of $\mathcal{O}$-modules carry over to global syzygies, at least provided we allow ourselves to tensor with $\mathcal{L}^{-k}$. As a consequence, $\mathrm{Ext}(M; \mathcal{F}, \mathcal{G})$ is well-defined and has functorial properties analogous to those of local Ext. The most important of these are the two long exact sequences.

⌈ Comment on $\underline{\mathrm{Ext}}^p_{\mathcal{O}}(\mathcal{F}, \mathcal{G})$

Def: $\underline{\mathrm{Ext}}^p_{\mathcal{O}}(\mathcal{F}, \mathcal{G})(U) \cong \bigcup_{x \in U} \mathrm{Ext}^p_{\mathcal{O}}(\mathcal{F}_x, \mathcal{G}_x) = \bigcup_{x \in U} H^p(\mathrm{Hom}(E.(\mathcal{F}_x), \mathcal{G}_x))$

$\{\sigma : U \to \bigcup_{x \in U} \mathrm{Ext}^p_{\mathcal{O}}(\mathcal{F}_x, \mathcal{G}_x)$ satisfying some conditions see Hartshorne Algebraic Geometry P60 ~ P62 ⌋

See note P646.

⌈ Here we have to prove the following:
Given two global syzygies of $\mathcal{F}$, i.e.,
$0 \to \mathcal{E}_n \to \mathcal{E}_{n-1} \to \cdots \to \mathcal{E}_0 \to \mathcal{F} \to 0$ & $0 \to \mathcal{E}'_n \to \mathcal{E}'_{n-1} \to \cdots \to \mathcal{E}'_0 \to \mathcal{F} \to 0$,