By the global duality theorem (I) on P707, P659 and P693,

$$H^0(\mathcal{S}, \mathcal{O}_Z \otimes \Omega^2) \otimes \mathrm{Ext}^2(\mathcal{S}; \mathcal{O}_Z, \mathcal{O}) \longrightarrow \mathbb{C}$$ is nondegenerate.

By the Global Duality Theorem II,

$$\begin{tikzcd}
H^0(\mathcal{S}, \mathcal{O}) \otimes \arrow[d, "\rho_*"'] & \mathrm{Ext}^2(\mathcal{S}; \mathcal{O}, \Omega^2) \arrow[r] & \mathbb{C} \arrow[d, equal] \\
H^0(\mathcal{S}, \mathcal{O}_Z) \otimes & \mathrm{Ext}^2(\mathcal{S}; \mathcal{O}_Z, \Omega^2) \arrow[u, "\rho^*"'] \arrow[r] & \mathbb{C}
\end{tikzcd}$$

$\tilde{\rho} : \mathcal{O} \to \mathcal{O}_Z$

By the comment on P659 & P693,

$$\begin{tikzcd}
H^0(\mathcal{S}, \mathcal{O} \otimes \Omega^2) \otimes \arrow[d, "\rho_*"] & \mathrm{Ext}^2(\mathcal{S}; \mathcal{O}, \mathcal{O}) \arrow[r] & \mathbb{C} \\
H^0(\mathcal{S}, \mathcal{O}_Z \otimes \Omega^2) \otimes & \mathrm{Ext}^2(\mathcal{S}; \mathcal{O}_Z, \mathcal{O}) \arrow[u, "\rho^*"'] \arrow[r] & \mathbb{C}
\end{tikzcd}$$

$$\begin{tikzcd}
\mathrm{Ext}^1(\mathcal{S}; I, \mathcal{O}) \arrow[r] \arrow[dd, leftrightarrow] & \mathrm{Ext}^2(\mathcal{S}; \mathcal{O}_Z, \mathcal{O}) \arrow[r, "\tilde{\rho}^*"] \arrow[d, phantom, "\displaystyle = \bigoplus_{p \in Z} \Lambda^2 T'_p \mathcal{S}"] \arrow[dd, leftrightarrow, shift right=8ex] & \mathrm{Ext}^2(\mathcal{S}, \mathcal{O}, \mathcal{O}) \arrow[d, equal, "\leftarrow \text{by } p71p \text{ note}"] \\
 & {} & H^2(\mathcal{S}, \mathcal{O}) \arrow[d, leftrightarrow] \\
\mathrm{Ext}^1(\mathcal{S}; I, \mathcal{O})^* & \mathrm{Ext}^2(\mathcal{S}; \mathcal{O}_Z, \mathcal{O})^* \arrow[l] \arrow[d, equal] & \mathrm{Ext}^2(\mathcal{S}, \mathcal{O}, \mathcal{O})^* \arrow[l, "(\tilde{\rho}_* =)\, \rho"'] \arrow[d, equal] \\
 & H^0(\mathcal{S}, \mathcal{O}_Z \otimes \Omega^2) \quad \displaystyle \bigoplus_{p \in Z} \Lambda^2 T'^*_p \mathcal{S} & H^0(\mathcal{S}, \mathcal{O} \otimes \Omega^2) \arrow[d, equal] \\
 & & H^2(\mathcal{S}, \Omega^2)
\end{tikzcd}$$

$$\left(\because \mathcal{O}_{Z,p} = \mathcal{O}_p / I_p \cong \mathbb{C} \right) \quad \bigoplus_{p \in Z} \mathcal{O}_{Z,p} \otimes \Omega^2_p \cong \bigoplus_{p \in Z} \Omega^2_p$$