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A vanishing theorem concerning the Artin component of a rational surface singularity.

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Let (X,x) be a rational surface singularity; denote by $\widetilde{X}$, $\hat{X}$ and X' the minimal resolution, the RDP-resolution and the space $X \setminus \{x\}$, respectively. On each of these spaces the authors consider the sheaf $\mathcal{F} := \Omega^1 \otimes \omega$, and they obtain the following chain of maps: $H^0(X,\mathcal{F}_X) \to H^0(\hat{X},\mathcal{F}_{\hat{X}}) \hookrightarrow H^0(\widetilde{X},\mathcal{F}_{\widetilde{X}}) \hookrightarrow H^0(X',\mathcal{F}_{X'})$. The paper contains the following results: (1) The dual spaces of T^1_X, $T^1_{\hat{X}}$, $\mathrm{Im}(T^1_{\widetilde{X}} \to T^1_{\hat{X}})$ and $\bigoplus_\nu T^1_{\hat{X}_\nu}$ ($\hat{X}_\nu$ are the germs of the rational double points of $\hat{X}$) are described as certain cokernels of the above maps (or their compositions). (2) $H^1(\hat{X},\mathcal{F}_{\hat{X}}) = 0$. (3) As an application, $T^{1\perp}_{\hat{X}} \subseteq T^{1*}_X$ is computed for 2-dimensional cyclic quotient singularities. *Klaus Altmann*