

Relative Spec and Proj constructions

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Let S be a base scheme. Fix a quasi-coherent sheaf \mathcal{A} of \mathcal{O}_S -algebras. If $X \xrightarrow{f} S$ is a scheme, write $\mathcal{A}_X = f^*\mathcal{A}$. The *relative spectrum* $\mathrm{Spec}(\mathcal{A})/S$ represents the functor

$$X \mapsto \mathrm{hom}_{\mathrm{Alg}(\mathcal{O}_S)}(\mathcal{A}_X, \mathcal{O}_X)$$