SHEAVES ON FINITE EI-CATEGORIES

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Abstract. There are many EI-categories in group representations and cohomology. Besides groups and posets, EI-categories include orbit categories, fusion systems and Brauer categories, to name a few.

Let $\mathscr{C}$ be a finite EI-category, given the dense (Grothendieck) topology $\mathcal{J}_{\mathrm{den}}$. On the site $\mathbf{C} = (\mathscr{C}, \mathcal{J}_{\mathrm{den}})$, the sheaf category $\mathrm{Sh}(\mathbf{C})$ is a full subcategory of the presheaf category $\mathrm{PSh}(\mathcal{C}) = \mathrm{Set}^{\mathcal{C}^{op}}$. We prove that the former is equivalent to $\prod_{[x]} \mathrm{Set}-\mathrm{Aut}_{\mathscr{C}}(x)$, where $[x]$ runs over the set of the isomorphism classes of the minimal objects of $\mathscr{C}$. Consequently, the category of sheaves of R-modules $\mathrm{Sh}(\mathbf{C}, R)$ is equivalent to $\prod_{[x]} \mathrm{Mod}-R\mathrm{Aut}_{\mathscr{C}}(x)$, where R is a coefficient ring.

This is based on joint work with Mawei Wu.

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Key words and phrases. EI-category, Grothendieck topology, site, sheaf, sheafification, topos, module, group representation.