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32310. *Abelian Sheaf Complexes and Picard 2-Stacks.*

In SGA4 Exposé XVIII, Deligne studies the relation between Picard stacks and length 2 complexes of abelian sheaves, as well as the relation between the morphisms of such objects. He proves that the functor

$$D^{[-1,0]}(\mathbf{S}) \longrightarrow \mathrm{Pic}^b(\mathbf{S})$$

is an equivalence.  $D^{[-1,0]}(\mathbf{S})$  is the subcategory of the derived category of category of complexes of abelian sheaves  $A^\bullet$  over a site  $\mathbf{S}$  with  $H^{-i}(A^\bullet) \neq 0$  only for  $i = 0, 1$  and  $\mathrm{Pic}^b(\mathbf{S})$  is the category of Picard stacks over  $\mathbf{S}$  with 1-morphisms isomorphism classes of additive functors.

The purpose of this talk is to generalize the above result to Picard 2-stacks. We give a definition of Picard 2-stack and define their 3-category  $2\mathrm{Pic}(\mathbf{S})$ . We also introduce a tricategory  $T^{[-2,0]}(\mathbf{S})$  of length 3 complexes of abelian sheaves. Then we construct a trihomomorphism

$$T^{[-2,0]}(\mathbf{S}) \longrightarrow 2\mathrm{Pic}(\mathbf{S}),$$

which we prove to be a triequivalence. From this triequivalence, we deduce a generalization of Deligne's analogous result about Picard stacks. (Received July 11, 2009)