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School of Mathematics, Dr. Homi Bhabha Road, Mumbai, 400005, India. *Categories of Modules
and their Deformations*.

Using Quillen-Lurie deformation theory formalism we develop an obstruction theory for studying the stable ∞ category of modules over a given geometric ∞ stack, and produce a more general version of the Thomason-Trobaugh localization theorem for triangulated categories. This helps us identify a large class of perfect geometric stacks. Applications include Grothendieck duality. (Received September 21, 2011)