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For  $\mathbf{s} = (s_1, s_2, \dots, s_n) \in \mathbb{Z}_{\geq 1}^n$ ,  $\mathbf{s}$ -lecture hall polytopes are a well studied family of simplices which admit many nice properties. In this work, we investigate which  $\mathbf{s}$ -lecture hall polytopes have Gorenstein, or more generally level, semi-group algebras. We provide a characterization of the Gorenstein property for a large family of  $\mathbf{s}$ -lecture hall polytopes and additionally provide a complete characterization of the level property in terms of  $\mathbf{s}$ -inversion sequences. (Received September 24, 2017)