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Oliver Gjoneski* (gjoneski@math.duke.edu), Durham, NC 27705. *Multi-Variable Period Polynomials Associated to Cusp Forms for $SL_2(\mathbb{Z})$* . Preliminary report.

In this paper we explore the notion of multi-variable period polynomials associated to cusp forms for $SL_2(\mathbb{Z})$. There are two equally important aspects of this problem, the homological, involving the definition of three-dimensional cells in the symmetric space $GL_3(\mathbb{R})/O_3(\mathbb{R})A(\mathbb{R})$, and the cohomological, involving holomorphic Eisenstein series associated to cusp forms on the boundary of this symmetric space. Delving deeper, we hope to present more insight into the Eilenberg-MacLane cohomology of $GL_3(\mathbb{Z})$. (Received September 22, 2010)