1046-11-1751 **M Knopp** and **H. Mawi*** (mawi@temple.edu), Temple University, Department of Mathematics, 1805 N. Broad St., Philadelphia, PA 19122. *Eichler Cohomology Theorem for Small Weights.*

Let $\mathbb{H}$ be the upper half-plane and Γ be a Fuchsian group of the first kind which is finitely generated and contains translations. Let $k \in \mathbb{R}$ and v be a multiplier system for Γ with weight k. We denote by $C^0(\Gamma, k, v)$, the set of cusp forms of weight k with multiplier system v. Let $\mathcal{P}$ be the space of functions g, which are holomorphic on $\mathbb{H}$ and which satisfy $|g(z)| < K(|z|^\rho + y^{-\sigma}),\ y = Imz > 0$, for some positive constants $K,\ \rho,$ and σ. Define the *slash operator*, $|_k^v$, which acts on a function f, defined on $\mathbb{H}$, as $f|_k^v M = \bar{v}(M)ij(M,z)^{-k} f(Mz)$. A collection $\{g_M \in \mathcal{P} : M \in \Gamma\}$ is said to be a *cocycle* in weight $-k$ if $g_{M_1 M_2} = g_{M_1}|_{-k}^v M_2 + g_{M_2},$ for all $M_1, M_2 \in \Gamma$, and a cocycle is called a *coboundary* if there exists $g \in \mathcal{P}$ such that $g_M = g|_{-k}^v M - g,$ for all $M \in \Gamma$. By using Petersson's principal parts condition we prove a conjecture by Knopp which states that the *Eichler Cohomolgy group of weight -k* , defined as cocycles modulo coboundaries is isomorphic to $C^0(\Gamma, k+2, \bar{v})$, if $-2 < k < 0$. (Received September 16, 2008)