1073-11-254 **Kathrin Bringmann** and **Zachary A Kent*** (kent@mathcs.emory.edu), Dept. of Math & CS, 400 Dowman Drive, W404, Atlanta, GA 30322. *L-series and L-values for weakly holomorphic modular forms.*

We explore a method for associating L-series to weakly holomorphic modular forms (those modular forms with possible poles supported at cusps), and then proceed to study their L-values. Critical L-values are shown to fit nicely within the framework of period polynomials and an extended Eichler-Shimura theory recently studied by Bringmann, Guerzhoy, Kent, and Ono. A generating series for non-critical L-values is then interpreted as a mock period function, extending recent work of Bringmann, Diamantis, and Raum. Finally, we prove a curious limiting theorem which relates transcendental periods of a mock modular form and its shadow to the ratio of their non-critical L-values. (Received August 02, 2011)