1035-05-404 **Bryan Clair*** (bryan@slu.edu), Saint Louis University, Mathematics and Computer Science, 220 N. Grand Ave., St. Louis, MO 63103. *L^2 zeta functions and infinite cyclic covers of graphs.*

Suppose that finite graphs $X = X_0$, X_1, X_2, ... all cover X and converge to an infinte graph Y. Then the Ihara zeta functions of the X_i converge, suitably normalized, to a zeta function associated to Y called the L^2 zeta function. The L^2 zeta function satisfies a formula similar to the Ihara-Hashimoto rationality formula, but is not in general a rational function. In the case $Y \to X$ is an infinite cyclic covering, the L^2 zeta function is algebraic, has an associated Riemann surface with finitely many sheets, and satisfies functional equations analogous to those for the Ihara zeta function. (Received September 06, 2007)