1064-13-258 **Shiro Goto** and **Jooyoun Hong*** (hongj2@southernct.edu), Department of Mathematics, Southern Connecticut State University, 501 Crescent Street, New Haven, CT 06515, and **Mousumi Mandal**. *The positivity of the first normalized Hilbert coefficients.*

In this joint work with Goto and Mandal, we are interested in the analysis of the first normalized Hilbert coefficient $\overline{e}_1(I)$. Let $(R, \mathfrak{m})$ be an analytically unramified local ring of positive dimension. For an $\mathfrak{m}$–primary ideal I, the normalized Hilbert function of R with respect to I is the length $\lambda_R(R/\overline{I^{n+1}})$, where $\overline{I^{n+1}}$ denotes the integral closure of I^{n+1}. This function is of polynomial type with degree d and we write

$$\lambda_R(R/\overline{I^{n+1}}) = \overline{e}_0(I)\binom{n+d}{d} - \overline{e}_1(I)\binom{n+d-1}{d-1} + \cdots + (-1)^d\overline{e}_d(I)$$

for sufficiently large n. One of our main results is to settle the positivity conjecture on $\overline{e}_1(I)$ posed by Wolmer V. Vasconcelos. More specifically we proved that if $(R, \mathfrak{m})$ is unmixed and analytically unramified local ring of positive dimension, then $\overline{e}_1(I)$ is nonnegative for every $\mathfrak{m}$–primary ideal I of R. (Received September 11, 2010)