1014-11-217 **Mary E. Flahive*** (flahive@math.oregonstate.edu) and **Richard T. Bumby** (bumby@math.rutgers.edu). *Inhomogeneous Diophantine approximation for irrationals with quasi-periodic continued fractions.* Preliminary report.

For θ and ϕ with $q\theta - \phi \notin Z$ for integral q, the inhomogeneous approximation constant is

$$M(\theta, \phi) = \inf_{|q| \mapsto \infty} \{ |q| \, |q\theta - \phi| \} .$$

Minkowski proved $M(\theta, \phi) \leq 1/4$, and J. H. Grace [Proc London Math Soc 17 (1918), 316–319] constructed θ with $M(\theta, 1/2) = 1/4$. We consider the case when $\phi \in Q(\theta)$ and the sequence of partial quotients of θ eventually is $\phi_1(0), \ldots, \phi_J(0), \ldots, \phi_1(i), \ldots, \phi_J(i), \ldots$, where $\{\phi_j(i)\}$ are arithmetic progressions. We extend work of Takao Komatsu which used many different types of continued fractions to calculate $M(e^{2/s}, \phi)$ for $\phi \in Q(\theta)$. Here we use regular simple continued fractions and a modification of Grace's method to generalize and obtain new results for the case when $\theta = e^{2/s}$. Among these are a characterization of pairs θ, ϕ (restricted as above) for which $M(\theta, \phi) = 0$ and a characterization of all $\phi = \frac{r\theta + m}{n}$ with $M(\theta, \phi) < 1/n^2$. The work uses a compactness theorem to relate $M(\theta, \phi)$ to the smallest value of the product of two linear expressions with rational coefficients. (Received August 25, 2005)