1067-11-1282 **David B. Leep*** (leep@email.uky.edu), Department of Mathematics, University of Kentucky, Lexington, KY 40506-0027. *Levels and Pythagoras numbers of commutative rings.* Preliminary report.

The level, $s(R)$, of a commutative ring R is the smallest integer n such that $-1 = a_1^2 + \cdots + a_n^2$ with each $a_i \in R$. If $s(R)$ is finite, we give rather precise estimates in terms of $s(R)$ for the sublevel and the Pythagoras number for the ring R, the polynomial ring $R[t]$, and the ring of formal power series $R[[t]]$. Some of the estimates improve results of M. Peters. Other results and open questions related to work of Dai-Lam will be presented. (Received September 20, 2010)