1014-20-169 **Arturo Magidin*** (`magidin@member.ams.org`), Mathematics Department, 217 Maxim Doucet Hall, P.O. Box 41010, Lafayette, LA 70504-1010. *Capability of nilpotent groups of class two and prime exponent.* Preliminary report.

A group $G$ is capable if $G \cong K/Z(K)$ for some group $K$. Using the nilpotent product, one can translate the problem of whether a given $p$-group of class two and exponent $p$ is capable to a question of linear algebra. Using this translation, a number of new results have been obtained, such as a new sufficient condition based on the ranks of $G/Z(G)$ and $[G, G]$. Explicitly, let $a$ be a positive integer; writing $a = \binom{T}{2} + s$, with $0 \leq s \leq T$, define $f(a) = \binom{T}{3} + \binom{s}{2}$. Let $G$ be a $p$-group of class two and prime exponent, with $\mathrm{rank}(G/Z(G)) = n$ and $\mathrm{rank}([G, G]) = m$. If

$$f\left(\binom{n}{2} - m + 1\right) < n,$$

then $G$ is capable. (Received August 07, 2005)