1056-11-361   **Jonathan Lubin*** (`lubinj@math.brown.edu`), 626 N Michigan Ave, Pasadena, CA 91106-1135.
Torsion points of higher order in the Nottingham group. Preliminary report.

If k is a finite field of characteristic p, then the set of formal series of the form $x + a_1 x^2 + a_2 x^3 + \cdots$ is a group under compostion, often called the Nottingham group over k; we denote it $N(k)$. It is a pro-p-group, and it is known that every finite p-group may be embedded in it. The torsion elements of $N(k)$ of order p are easy both to classify and to describe, but explicit constructions of elements of order p^m with $m > 1$ have not been well known.

In this talk I will point out that standard constructions in the theory of formal groups in characteristic zero give infinitely many nonconjugate torsion elements of $N(k)$ of any arbitrarily high order, but that these are very special among all torsion elements. Then I will sketch a construction that has nothing to do with the preceding method, but instead uses simple considerations of local class-field theory in characteristic p to give a coarse classification of all torsion elements of $N(k)$, and a way of approaching the much more difficult question of a complete classification up to conjugacy. (Received September 02, 2009)

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