**Coleman, Robert F.**

**On the Galois groups of the exponential Taylor polynomials.** (English) Zbl 0672.12004

Enseign. Math., II. Sér. 33, 183-189 (1987).

Let $f_n(X)$ be the polynomial $1 + x + x^2/2! + \cdots + x^n/n!$ over $\mathbb{Q}$. Then [cf. *I. Schur*, Sitzungsber. Akad. Wiss. Berlin 1930, 443–449 (1930; JFM 56.0110.02)] the Galois group of $f_n(X)$ is the alternating group $A_n$ if 4 divides $n$ and it is equal to the symmetric group $S_n$ otherwise.

This paper gives a new elegant proof of this fact making efficient use of $p$-adic Newton polygons to find out things about the degrees of the factors of $f_n(X)$ over the $p$-adic completions $\mathbb{Q}_p$.

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**MSC:**

11R32 Galois theory
12F10 Separable extensions, Galois theory



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Galois groups of the exponential Taylor polynomials; p-adic Newton polygons