

**p -ADIC INTERPOLATION OF THE
COEFFICIENTS OF HURWITZ SERIES
ATTACHED TO HEIGHT ONE FORMAL GROUPS**

C. SNYDER

1. Introduction. In a series of articles [16, 17, 18] we studied Kummer congruences for the coefficients of Hurwitz series associated with a differential on an algebraic curve. Actually, the proper setting turns out to be Hurwitz series attached to formal groups over integral rings. (See the definitions below.)

The object of this paper is to partially answer a question posed to us by J-P. Serre [15] as to whether we could strengthen the Kummer congruences considered in our earlier papers by using the concept of the Iwasawa algebra. We accomplish this with the aid of p -adic measure theory in the case that the formal groups are of height one.

2. Preliminaries. Throughout the paper we let p denote a fixed prime which, for convenience, we assume to be odd. We let \mathbf{C}_p denote the completion of an algebraic closure of \mathbf{Q}_p , and O_p the ring of integers of \mathbf{C}_p . Let K be a finite extension of \mathbf{Q}_p with ring of integers O_K .

Recall that \mathbb{Z}_p^x may be written as a direct product $\mathbb{Z}_p^x = V \times U$ where V is the group of p -1st roots of unit in \mathbb{Z}_p and $U = 1 + p\mathbb{Z}_p$, the group of principal units in \mathbb{Z}_p^x . If $x \in \mathbb{Z}_p^x$, then we denote by $\omega(x)$ and $\langle x \rangle$ the projections of x onto V and U , respectively. Furthermore, recall that if u is a topological generator of U , then the mapping $\mathbb{Z}_p \rightarrow U$ given by $x \rightarrow u^x$ is a topological group isomorphism of \mathbb{Z}_p with U .

We now summarize some of the standard material on formal groups which we use in the paper.

Definition. Let A be a commutative ring with 1. Then a (one parameter) *formal group* (law) *over* A is a power series $F(X, Y) \in A[[X, Y]]$ satisfying:

- a) $F(X, Y) = X + Y +$ "higher degree terms",

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