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CORRECTIONS TO "THE EISENSTEIN CONSTANT"

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Section 1. Let $f \in \mathbf{Z}[X, Y]$ be a polynomial with coefficients bounded by H and of degree m in X and n in Y. Then for any formal power series solution $Y = \alpha_0 + \alpha_1 X + \cdots + \in \bar{Q}[[X]]$ of the equation $f(X, Y) = 0$, there exist natural integers a_0, a such that $a_0 a^i \alpha_i$ is an algebraic integer for all i. In [1] we showed that

$$a \leqslant \lambda_n \mu_n |D_\mu|_\infty$$

where

$$\mu_n = \prod_{p \leqslant n} p, \qquad \lambda_n = \exp(\tau_n + \psi(n))$$

$$\tau_n = \sum_{p \leqslant n} \frac{1}{p-1} \log p$$

$$\psi(n) = \sum_{p \leqslant n} \left[\frac{\log n}{\log p}\right] \log p$$

and D_μ is the coefficient of minimal degree in the discriminant

$$R(f, f_Y) = D(X) = X^{\ell}(D_\mu + D_{\mu-1} + \cdots + D_0 X^\mu).$$

We incorrectly estimated

$$|D_\mu|_\infty \leqslant n^n (2n-1)! H^{2n-1}. \tag{1}$$

This should be corrected by replacing H by $H(1 + m)$, i.e.,

$$a \leqslant \lambda_n^n \mu_n n^n (2n-1)! (1+m)^{2n-1} H^{2n-1}. \tag{2}$$

If we use the Hadamard lemma in estimating the determinant, $D(X)$, we obtain

$$|D_\mu|_\infty \leqslant ((1+m)H)^{2n-1}(1+n)^{(n-1)/2}(1 + 2^2 + \cdots + n^2)^{n/2}$$

$$\leqslant ((1+m)H)^{2n-1}(1+n)^{2n-(1/2)}$$

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