ELDER GOVE GRIFFITH

Galois module structure of ideals in wildly ramified cyclic extensions of degree $p^2$


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CORRIGENDUM

GALOIS MODULE STRUCTURE OF IDEALS IN WILDLY RAMIFIED CYCLIC EXTENSIONS OF DEGREE \( p^2 \)

by Gove Griffith ELDER

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The author would like to thank Nigel Byott for pointing out the errors in Theorem 1. Base upon the following lemmas the exponents \( d_r, b \) and \( h_i \) should read:

- Based upon Lemma 8, \( d_r = [(n + (r + 1)pb_1)/p^2] - \max \{[n/p^2], \lambda_2,0 - e_0\} \).

- Based upon Lemma 7, \( b = \sum_{j=0}^{r-1} \left( [(n - (p - j - 1)pb_1)/p^2] - [(n - (p - j)pb_1)/p^2] \right) + \sum_{j=0}^{r-1} \left( \min \{[(\lambda_2,1(n) - (s_j - j)b_1)/p] - e_0, [(n-(p-j-1)pb_1)/p^2] - [(n-(p-j)pb_1)/p^2] \} + \sum_{j=r,s_j \geq p-1} \max \{0, \lambda_2,0(n) - e_0 - [(n + rp b_1)/p^2]\} \).

- Based upon Lemma 7, \( h_i = \sum_{j=0}^{r-1} \max \{0, [(n - (p - j - 1)pb_1)/p^2] - [(\lambda_2,1(n) - (s_j - j)b_1)/p] - e_0, [(n - (p - j - 1)pb_1)/p^2] - [(n - (p - j)pb_1)/p^2] \} + \sum_{j=r,s_j \geq p-1} \max \{0, \lambda_2,0(n) - e_0 - [(n + rp b_1)/p^2]\} \).

A cursory glance at the statement of Theorem 1 might suggest the appearance of many different types of \((R^2, R^1; \lambda^i)\) in a given ideal. This is
misleading. Usually only one or two $h_i$ is nonzero. In fact, generally the only nonzero $h_i$ are $h_r$ and $h_{r+1}$.

Finally, we note one may use Nakayama’s lemma instead of our methods, see 640-644, to prove Step 3, for example [G.G. Elder and M.J. Madan, Galois module structure of integers in wildly ramified $C_p \times C_p$-extensions, Can. J. Math., 49, n°4 (1997), 722-735].


Gove Griffith ELDER,
University of Nebraska at Omaha
College of Arts and Sciences
Department of Mathematics
Omaha, NE 68182-0243 (USA).
elder@unomaha.edu