ERRATA
CORRECTION TO
LOEWY SERIES AND SIMPLE PROJECTIVE MODULES IN THE CATEGORY $\mathcal{O}_S$

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Lemma 2.3 and Corollary 2.3 of this paper are stated in a form which is stronger than what is actually proved. Weaker statements can be substituted, for which the given proofs are correct and which are sufficient for the later applications.

Lemma 2.3 lacks a hypothesis, as is apparent from the proof given. What is actually proved is the following statement:

Lemma. *Let M and N be modules in $\mathcal{O}^{\mu}$ with $M \subsetneq \operatorname{rad} N$. Then $\ell\ell T_{\mu}^{\lambda} M < \ell\ell T_{\mu}^{\lambda} N$.*

Let us call a module M rigid if its socle and radical filtrations coincide. Corollary 2.3 should read as follows:

Corollary. *Let M be a subquotient of $\operatorname{soc}^{r+s} P(w_\lambda \mu)/\operatorname{soc}^r P(w_\lambda \mu)$ with $\ell\ell M = s$. Let $t = \ell\ell P(w_\lambda \mu)$ and assume that $\operatorname{soc}^{r+s} P(w_\lambda \mu) = \operatorname{rad}^{t-r-s} P(w_\lambda \mu)$. (For instance, assume that $P(w_\lambda \mu)$ is rigid.) Then $\ell\ell T_{\mu}^{\lambda} M = s + 2\ell(w_{\mu}^{0})$.*

The corollary follows from the Lemma, via the proof given in the paper. In the paper, the partial rigidity assumption was omitted; however, in the later applications of the Corollary, rigidity holds, so that the re-formulated Corollary applies. Let us briefly review the specific places in the paper where the Corollary is quoted.

–Part (iii) of Corollary 5.1 depends on Corollary 2.3. It may be applied as intended, since $P(\nu_8)$ is shown to be rigid in Proposition 5.1.

–Part (a) of the proof of Proposition 5.2 inadvertantly quotes Lemma 2.3; what is intended is Lemma 1.6.

–Part (1) of the proof of Proposition 5.3 has the claim that Corollary 2.3 can be carried over to the module $P_S(\mu^-)$. Since $P_S(\mu^-)$ is shown to be rigid in 5.2, this is correct. Thus the applications in the remainder of the proof of Proposition 5.3 are valid.

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CORRECTION TO SUMS OF PRODUCTS OF POWERS OF GIVEN PRIME NUMBERS

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Lemma 3(b) is false and hence the proof of Theorem 3 needs revision. We present a corrected version of Lemma 3(b) and a proof of Theorem 3 based on it.

LEMMA 3(b). *If* $3^b \mid 2^a + 1$, *then* $a \geq 3^{b-1}$.

Proof. If $3^b \mid 2^a + 1$, then $2^{2a} - 1 = (2^a + 1)\,(2^a - 1) \equiv 0 \pmod{3^b}$. Since 2 is a primitive root of 3^b for any $b \in \mathbf{N}$, $\varphi(3^b) \mid 2a$ where $\varphi(x)$ is the Euler's function. Hence $3^{b-1} \mid a$. □

Proof of Theorem 3. Without loss of generality we may assume that $x \geq 1$, $y \geq 0$, $z \geq 2$, $w \geq 1$. By (1.3) and Lemma 3(b), we have $x \leq z$ and $z \geq 3^{\min(y,w)-1}$. We derive from (1.3) that $2^x \mid 3^w - 1$ and therefore $2^{x-2} \leq w$. Hence

$$x < (\log 2)^{-1} \log w + 2.$$

We distinguish between two cases.