Correction to: "Collineation Groups of Derived Semifield Planes III"

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Lemma 5 of [2] is not stated correctly. The following argument may be substituted for lemmas 4, 5 and 6.

If $\overline{\pi}_O \cap \overline{\pi}_O x = \bar{X} \neq \{O\}$ let l be a component of $\overline{\pi}$ such that $l \cap \bar{X} \neq \{O\}$. Assume $|l \cap \bar{X}| = 2^s$ where $q = 2^r$ so that $s \leqq r$. Since S is simple and fixes l, S is faithful on l and permutes $\{\overline{\pi}_O x \cap l\}$ for all $x \in S$. Thus, S is also faithful on $l - \{\overline{\pi}_O x \cap l\}$ since the fixed points of the 2-elements of S on l are in $\{\overline{\pi}_O x \cap l\}$. The cardinality of $\{\overline{\pi}_O x \cap l\}$ is $(q+1)(2^r - 2^s) + 2^s$. So the cardinality of $l - \{\overline{\pi}_O x \cap l\}$ is $q(2^s - 1)$. If P is a point of this set then S_P does not contain a 2-element and thus is cyclic of order dividing $q \pm 1$. But, $|S| = q(q^2 - 1)$ so that $(q^2-1)/2^s - 1 \leqq |S_P| \leqq q+1$. This implies that $|S_P| = q+1$ and that $s = r$. So $\bar{X}$ is a line of both $\overline{\pi}_O$ and $\overline{\pi}_O x$ and both Q and Q^x are groups of generalized elations of l with axis $\bar{X}$. But, then $\langle Q, Q^x \rangle$ must induce a 2-group on l which is a contradiction.

This completes the proof of the main theorem [2].

Corollary. *Let π be a translation plane of order q^2, q even, which admits a collineation group $\mathcal{G}$ isomorphic to $SL(2, q)$, $q > 2$, in its translation complement. If each Sylow 2-subgroup of $\mathcal{G}$ fixes some Baer subplane pointwise then these subplanes are the component subplanes of a derivable net.*

Proof. Assume the indicated Baer subplanes form a partial spread. Hering's lemma 7 [1] reformulated in terms of Baer 2-elements (Hering's proof is valid in this situation by the *assumption* that the Sylow 2-subgroups fix Baer subplanes pointwise) shows that lemma 3 of [2] is valid here. That is, in this case the Baer axes are the component subplanes of a derivable net.

Thus, we may assume the Baer subplanes intersect non-trivially. The action of $\mathcal{G}$ on these subplanes is the same as indicated in [2]. The argument given above shows that this assumption leads to a contradiction.

References

[1] Ch. Hering, On Shears of Translation Planes. Abh. Math. Sem. Univ. Hamburg **37**, 258–268 (1972).

[2] N. L. Johnson, Collineation Groups of Derived Semifield Planes III. Arch. Math. **26**, 101–106 (1975).

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