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Oscar E. Vega* (ovega@math.uiowa.edu), 14 MLH, Department of Mathematics, The University of Iowa, Iowa City, IA 52242. *j, k – planes of order 4^3 .*

Historically, most of the study of translation planes has been focused on planes of dimension 2 over their kernel or, in other words, with spreads in $PG(3, q)$. Our work does not follow this trend. In this talk we will show just a first case of what we believe is an infinite family of planes of order q^n and dimension n over their kernels that admit a homology group of index $q - 1$.

In [2] we have constructed and studied a new class of translation planes of order 4^3 (three dimensional over their kernel). These planes are a generalization of the *j – planes* discovered by Johnson, Pomareda and Wilke in [1]. These *j, k – planes*, may be (André) replaced and the *j, k – planes* and the planes obtained by André replacement may be derived. The final count yields thirteen new planes constructed and classified.

Finally, using regular hyperbolic covers of some of the planes introduced above, we are able to construct some new flat flocks of Segre varieties.

References

[1] Johnson, N. L.; Pomareda, R.; Wilke, F. W. *j*-planes. J. Combin. Theory Ser. A 56 (1991), no. 2, 271–284.

[2] Johnson, N.L.; Vega, O; Wilke F.W. *j, k*–planes of order 4^3 . Innovations in Incidence Geometry. To appear.

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