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**Stefan O Tohaneanu\*** ([stohanea@uwo.ca](mailto:stohanea@uwo.ca)), Department of Mathematics, University of Idaho, Moscow, ID 83844. *Hyperplane arrangements with many (two) Euler vector fields*. Preliminary report.

Let  $\mathcal{A} \subset \mathbb{P}^{k-1}$  be a rank  $k$  complex arrangement of  $n$  hyperplanes, containing the coordinate hyperplanes. Every hyperplane arrangement has an Euler vector field due to the Euler formula for homogeneous polynomials. Any other Euler vector field translates into a linear syzygy on the Jacobian ideal of the defining polynomial of  $\mathcal{A}$ . In this special case, the points dual to the hyperplanes lie on an eigen-scheme. The primary decomposition of the defining ideal of this scheme shows that  $\mathcal{A}$  is a product of smaller arrangements. Also, we will see that this ideal is the edge ideal of a complete multipartite graph. (Received July 12, 2013)