1016-57-260 **Daniel C Cohen** and **Graham C Denham***, Department of Mathematics, Middlesex College, University of Western Ontario, London, Ontario N6A 2B7, Canada, and **Michael Falk** and **Alexander Varchenko**. *The critical set of a product of powers of linear forms.* Preliminary report.

Define a multivalued holomorphic function $\Phi_\lambda = f_1^{\lambda_1} \cdots f_n^{\lambda_n}$, where each f_i is a linear polynomial and each λ_i is a complex number. In 1995, Orlik, Terao, and Varchenko showed that, for a Zariski-open set of exponents λ, the (projective) critical set of Φ_λ is discrete. The set of critical points is in bijection with a basis for the single, nonvanishing cohomology group of the associated hyperplane complement, with coefficients in a rank-one local system determined by Φ_λ.

More generally, we find for certain "resonant" exponents λ, the critical set is positive-dimensional, and some of its geometry is predicted by the cohomology of the Aomoto complex (an approximation to the cohomology above.) (Received February 13, 2006)