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*Intersection complexes and unramified  $L$ -functions.*

Integral representations of  $L$ -functions can be expressed as pairings between automorphic forms and theta series of functions on spherical varieties (or more general objects). Let  $X$  be an affine spherical variety over the ring  $\mathfrak{o}$  of integers of a non-Archimedean local field. When  $X$  is singular, the naive functions (such as the characteristic function of  $X(\mathfrak{o})$ ) are not the correct ones for this purpose. Rather, one should think of  $X(\mathfrak{o})$  geometrically — in equal characteristic, as the points of the arc space of  $X$  — and work with functions coming from intersection cohomology via the sheaf–function dictionary. In joint work with Jonathan Wang, under assumptions on an affine spherical variety  $X$  over a finite field, we prove that the intersection complex of the arc space of  $X$  encodes a certain unramified  $L$ -function. (Received January 14, 2021)