1136-14-380 **Mihai Fulger*** (mihai.fulger@uconn.edu), Department of Mathematics, University of Connecticut, 341 Mansfield Rd, Storrs, CT 06268. *Local volumes as limits.*

If $\pi : Y \to X$ is a proper birational morphism over X normal, and if $x \in X$ is a closed point, then for all divisors D on Y, the local volume of D around x is defined as the asymptotic lim sup of the cohomology with supports $\dim H^1_x(X; \pi_* \mathcal{O}_Y(mD))$ as m grows. Particular cases include the Hilbert-Samuel multiplicity of X at x, or Wahl's volume of an isolated normal surface singularity. We prove that lim sup in the definition of the local volume can be replaced by lim, and that the local volume naturally measures the volume of a difference of nested convex bodies. For this we employ Newton-Okounkov semigroup techniques. A difficulty is the apparent impossibility of reducing the question to a study of linear series of multiples of a fixed divisor on a projective variety. (Received January 20, 2018)