

THE REAL GAMMA AND ZETA FUNCTIONS ARE JOINTLY O-MINIMAL

PATRICK SPEISSEGGER

We develop multisummability, in the positive real direction, for generalized power series with natural support, and we prove o-minimality of the expansion of the real field by all multisums of these series. This resulting structure expands (i) the expansion of the real field by all multisummable (in the positive real direction) power series, and (ii) the reduct of \mathbb{R}_{an^*} generated by all convergent generalized power series with natural support. In particular, its expansion by the exponential function defines both the Gamma function on $(0, \infty)$ and the Zeta function on $(1, \infty)$.