

# Blowing-up solutions for a nonlocal Liouville type equation in a union of intervals

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We consider the nonlocal Liouville type equation  $(-\Delta)^{\frac{1}{2}}u = \varepsilon\kappa e^u$  in the union  $I$  of  $d \geq 2$  disjoint bounded intervals, coupled with homogeneous Dirichlet exterior data. Here,  $\kappa$  is a smooth bounded function with positive infimum and  $\varepsilon > 0$  is a small parameter. For any integer  $m \in [1, d]$ , we construct a family of solutions  $\{u_\varepsilon\}$  which blows up at  $m$  distinct interior points of  $I$  and for which  $\varepsilon \int_I \kappa e^{u_\varepsilon} dx \rightarrow 2m\pi$  as  $\varepsilon \searrow 0$ . Moreover, we show that, when  $d = 2$  and  $m$  is suitably large, no such construction is possible.

The talk is based on a joint work with Antonio J. Fernández (ICMAT, Madrid).