

# NONLOCAL QUADRATIC FORMS WITH VISIBILITY CONSTRAINT

VANJA WAGNER

Given a subset  $D$  of the Euclidean space, we study nonlocal quadratic forms that take into account tuples  $(x, y) \in D \times D$  if and only if the line segment between  $x$  and  $y$  is contained in  $D$ . In this talk, we discuss regularity of the corresponding Dirichlet form for special classes of jumping kernels and domains  $D$ , leading to the existence of a pure jump process on  $D$  with, so called, visibility constraint. Furthermore, we study the corresponding Poincaré inequalities in dumbbell shaped domains and show that these nonlocal forms satisfy a Poincaré inequality with diffusive scaling.

This talk is based on joint work with Moritz Kassmann.

## REFERENCES

- [1] Bartłomiej Dyda. On comparability of integral forms. *J. Math. Anal. Appl.*, 318(2):564–577, 2006.
- [2] Masatoshi Fukushima, Yōichi Ōshima, and Masayoshi Takeda. *Dirichlet forms and symmetric Markov processes*, volume 19 of *de Gruyter Studies in Mathematics*. Walter de Gruyter & Co., Berlin, 1994.
- [3] Moritz Kassmann and Vanja Wagner. Nonlocal quadratic forms with visibility constraint. *Preprint*, 2018.
- [4] Martí Prats and Eero Saksman. A  $T(1)$  theorem for fractional Sobolev spaces on domains. *J. Geom. Anal.*, 27(3):2490–2538, 2017.