

ROBUSTNESS OF COMMUNITY DETECTION TO RANDOM GEOMETRIC PERTURBATIONS

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Abstract: We consider the stochastic block model where connection between vertices is perturbed by some latent (and unobserved) random geometric graph. The objective is to prove that spectral methods are robust to this type of noise, even if they are agnostic to the presence (or not) of the random graph. We provide explicit regimes where the second eigenvector of the adjacency matrix is highly correlated to the true community vector (and therefore when weak/exact recovery is possible). This is possible thanks to a detailed analysis of the spectrum of the latent random graph, of its own interest.

Joint work with Sandrine Peche.