

Smoothing effect and Strichartz estimates for some time-degenerate Schrödinger operators

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In this talk we will first investigate the local smoothing effect (both homogeneous and inhomogeneous) for time-degenerate Schrödinger operators of the form

$$\mathcal{L}_{\alpha,c} = i\partial_t + t^\alpha \Delta_x + c(t,x) \cdot \nabla_x, \quad \alpha > 0,$$

where $c(t,x)$ satisfies suitable decay conditions. The local smoothing effect will then be used to prove local well-posedness results for the associated nonlinear Cauchy problem.

Afterwards we will show the validity of Strichartz estimates for a class of operators similar to the previous one, that is of the form

$$\mathcal{L}_b := i\partial_t + b'(t)\Delta_x,$$

with b' satisfying suitable conditions. An application of these estimates will give a (different) local well-posedness result for a semilinear Cauchy problem associated with \mathcal{L}_b .