



**The Hong Kong University of Science and Technology**

**Department of Mathematics**

**Seminar on PDE**

**Limiting Sobolev estimates for vector fields and  
canceling differential operators**

**By**

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**Abstract**

In the limiting case  $p=1$  of the Calderón–Zygmund estimates, the  $L^1$  norm of a homogeneous vector differential operator cannot be used to estimate other derivatives of the same order. If one is interested in Sobolev-type estimates on lower-order derivatives, these hold (Bourgain–Brezis estimates) or fail depending on the operator. The question whether the latter estimate holds can be determined on any homogeneous vector differential operator by determining whether it satisfies a new canceling condition in addition to the classical ellipticity condition. This result unifies classes of known inequalities and extends to the case of Hardy inequalities.

**Date : Thursday, 15 March 2018**

**Time: 2:00 p.m. – 3:00 p.m.**

**Venue: Room 5562, Academic Building,  
HKUST (near Lifts 27&28)**

***All are welcome!***