Maximal operators related to curves in the plane

Joris Roos

Abstract.
The talk will consist of two parts. In the first part, the discussion will focus on an analogue of Carleson’s operator associated with integration along a monomial curve. In that context it is natural to ask whether the methods of time-frequency analysis carry over to an anisotropic setting. We answer that question and also provide certain partial bounds for the Carleson operator along monomial curves using entirely different methods. In the second part, I will present some results for maximal operators and Hilbert transforms along variable curves. Apart from the intrinsic interest in these operators, another motivation stems from Zygmund’s conjecture on differentiation along Lipschitz vector fields. In particular, we can prove a curved variant of the conjecture.