PDE with loss of derivatives

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Abstract: Let $X_1, ..., X_p$ be complex valued vectorfields in R^n. Let E be the operator

$E = X_1^* X_1 + ... X_p^* X_p.$

The main topic of the lecture will be to show that many such operators have existence and hypoellipticity with loss of derivatives. The main problem is how to prove estimates with loss of derivatives when one does not know what the inverse looks like. Microlocal techniques are necessary and will be discussed in the talk.