1047-32-166 **Emil J. Straube*** (straube@math.tamu.edu), Department of Mathematics, Texas A&M University, College Station, TX 77843. *Compactness and $\mathcal{L}^2_{loc}$-hypoellipticity for $\overline{\partial}$.* Preliminary report.

I will raise a question concerning the two properties in the title. It is an old result that $\overline{\partial}$ is hypoelliptic in $\mathcal{L}^2_{loc}(\Omega)$ if and only if no compact subset of the boundary of Ω picks up plurisubharmonic hull (Catlin, Diederich-Pflug, Sibony). On the other hand, Catlin had proved earlier that for a smooth pseudoconvex domain in $\mathbb{C}^2$, the latter property is equivalent to the absence of analytic discs from the boundary. Thirdly, also for smooth domains in $\mathbb{C}^2$, Catlin showed that compactness of the $\overline{\partial}$-Neumann operator implies the absence of analytic discs from the boundary. Consequently, in $\mathbb{C}^2$, compactness of the $\overline{\partial}$-Neumann operator implies hypoellipticity of $\overline{\partial}$ in $\mathcal{L}^2_{loc}$. Şahutŏglu and I recently generalized Catlin's results to pseudoconvex domains in $\mathbb{C}^n$ with the property that the Levi form, at each point, has at most one degenerate eigenvalue. Thus the above implication holds in this case as well. However, this implication should not hinge on this special property of the Levi form. (Received January 28, 2009)