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Some properties of solutions to hypoelliptic equations

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A linear different operator L is called weakly hypoelliptic if any local solution u of $Lu=0$ is smooth. We allow for systems, i.e. the coefficients may be matrices, not necessarily of square size. This is a huge class of important operators which covers all elliptic, overdetermined elliptic, subelliptic and parabolic equations.

We extend several classical theorems from complex analysis to solutions of any weakly hypoelliptic equation: the Montel theorem providing convergent subsequences, the Vitali theorem ensuring convergence of a given sequence and Riemann's first removable singularity theorem. In the case of constant coefficients we show that Liouville's theorem holds, any bounded solution must be constant and any L_p -solution must vanish.

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