

Jan Cristina, "ODE's of low regularity"

Abstract

The Picard-Lindelöf theorem says that the differential equation $\dot{\varphi}(t) = b(t, \varphi(t))$ has locally unique solutions when b is Lipschitz, i.e. Sobolev $W^{1,p}$ for $p = \infty$. One might wonder if this problem can be posed with less regularity than Lipschitz? Could b be only continuous? or weakly differentiable? can we make p smaller? and if so how much? In his paper "Transport equation and Cauchy problem for BV vector fields", Luigi Ambrosio examines first the somewhat related transport equation, and applies that to the ODE in the case where b is only BV . I will attempt to outline his proofs, and discuss in what context this might prove useful. The talk will be in English or Finnish depending on the audience and I will briefly introduce Sobolev and BV spaces. More information can be found at <http://www.ams.org/mathscinet-getitem?mr=2096794>.