

Concerning the existence of classical solutions to elliptic boundary value problems.

H. Beirão da Veiga

ABSTRACT: We say that a solution to a boundary value PDE problem is classical if all derivatives appearing in the equations are continuous up to the boundary. It is well known that solutions to "classical" linear elliptic boundary value problems (for instance, the Stokes system) are classical if the external forces belong to a Hölder space $C^{0,\lambda}(\overline{\Omega})$. It is also well known that, in general, solutions are not classical in the presence of merely continuous external forces. Hence, a challenging problem is to find Banach spaces, strictly containing the Hölder spaces $C^{0,\lambda}(\overline{\Omega})$, such that solutions are classical for data in that space. We will discuss this matter, and related problems.