

# On the role of the de Rham diagram in the finite element method

Pavel Kůs

Matematický ústav AV ČR, Praha

The de Rham diagram is a scheme that relates spaces used in partial differential theory to model various physical phenomena with corresponding finite element spaces. The diagram not only puts spaces  $H^1$ ,  $H(\text{curl})$ ,  $H(\text{div})$  and  $L^2$  together and shows their connection through differential operators, but is also essential for proper construction of vector-valued basis functions in spaces  $H(\text{curl})$  and  $H(\text{div})$ . It is also a useful tool for investigation of stability and convergence of Maxwell's equations.

In this contribution we want to show the general idea of the de Rham diagram and address some of its applications.