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SOBOLEV SPACES OF SYMMETRIC FUNCTIONS AND APPLICATIONS

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We prove sharp pointwise estimates for functions in the Sobolev spaces of radial functions defined in a ball. As a consequence, we obtain some imbeddings of such Sobolev spaces in weighted L^q-spaces. We also prove similar imbeddings for Sobolev spaces of functions with partial symmetry. Our techniques lead to new Hardy type inequalities. It is important to observe that we do not require any vanishing condition on the boundary to obtain all our estimates. We apply these imbeddings to obtain radial solutions and partially symmetric solutions for a biharmonic equation of the Hénon type under both Dirichlet and Navier boundary conditions. The delicate question of the regularity of these solutions is also established.

This is a joint work with Djairo Guedes de Figueiredo and Olímpio Hiroshi Miyagaki.

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