

MRI course

Variational and Topological Methods for PDEs

Exercises 3

1. Exercise 8.6.2 from Evans
2. Derive the Euler-Lagrange equation(s) for the functional

$$I(u_1, u_2) = \int_U [\nabla u_1 \cdot \nabla u_2 + u_1^2 u_2^2] dx.$$

3. For I an interval, show that the embedding $W^{1,1}(I) \hookrightarrow C^0(I)$ is not compact.