Suggested Homework

Nonlinear Multiscale Methods for Image and Signal Analysis

Exercise 1. Consider the gradient flow

$$\partial_t u(t) = -p(t), \qquad p(t) \in \partial J(u(t)), u(0) = f,$$

for 1-homogeneous J. Show (formally), that the definition of the spectral response as

$$S(t) = t\sqrt{\partial_{tt} J(u(t))}$$

admits a Paseval-type identity in the sense that

$$\int_0^\infty (S(t))^2 \, dt = \|f\|_2^2.$$

Hint: Integration by parts!

Exercise 2. <u>Repeat the content of the lecture!</u>