Matematiikan ja tilastotieteen laitos
Topics in geometric Fourier analysis
Exercise 2
10.2.2012

1. What kind of decay estimate can you get for the Fourier transfrom of the surface measure on the conical surface

$$\{(z,t) \in \mathbb{R}^3 : |z| = t, 1 \leq t \leq 2\}?$$

2. Prove that the formulas (4.1) and (4.2) are equivalent.

3. Prove Lemma 4.2.

4. Prove Proposition 4.1.

5. Show that there can be no inequality $\|\widehat{f\mu}\|_{L^p(\mathbb{R}^2)} \leq C_{p,q}\|f\|_{L^q(\mu)}$ for any $1 \leq p < \infty, 1 \leq q \leq \infty$, where μ is the one-dimensional Lebesgue measure on the segment $[(-1,0),(1,0)]$.