Harmonic Analysis

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ABSTRACT: The course will focus on topics in classical harmonic analysis that are linked with mathematical physics and in particular spectral theory of self-adjoint operators. Some applications in Fourier analysis will be also discussed.

SYLLABUS

1. Poisson transform and Radon–Nikodym derivatives

2. Local L^p norms, $0 < p < 1$

3. Weak convergence

4. Local L^p norms, $p > 1$

5. Local version of the Wiener theorem

6. Poisson representation of harmonic functions

7. The Hardy class $H^\infty(\mathbb{C}_+)$

8. The Borel transforms of measures

9. Spectral theorem—the cyclic case

10. Spectral theory of rank one perturbations

REFERENCES

- H. DYM, H. P. MCKEAN: *Fourier Series and Integrals*, Academic Press, 1972.

- Y. KATZNELSON: *An Introduction to Harmonic Analysis*, Cambridge University Press, 2004.

- V. JAKŠIĆ: *Topics in Spectral Theory*, Open Quantum Systems I. Lecture Notes in Mathematics, vol. 1880, 235–312, Springer, 2006.