Fourier restriction estimates and applications

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Abstract. This introductory course is concerned with the Fourier restriction estimates and related problems. The Fourier restriction phenomena were observed by E.M. Stein in 1960s. Since then, there has been a long line of investigations but, except for some special cases, the problem remains open wide even for the simplest model surfaces such as the sphere and the cone. However, the developments in this area have found many interesting applications and connections to other fields. In this series of lectures I will present basic theory and techniques including some of recent results, and applications to related problems.

Lecture 1. Introduction and oscillatory integrals
Lecture 2. L^2-restriction estimate: TT^*-argument, Strichartz estimate
Lecture 3. Uniform Sobolev inequality
Lecture 4. Oscillatory integral operator and Carleson-Sjölin condition
Lecture 5. Spherical harmonic projection and Carleman estimate
Lecture 6. Bilinear and multilinear restriction estimates