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**Tzu-Chu Lin\*** ([lin@uwm.edu](mailto:lin@uwm.edu)), Department of Mathematical Sciences, University of Wisconsin-Milwaukee, P.O.Box 413, Milwaukee, WI 53201. *Helmholtz's equation and its inverse problems.*

Integral equation methods are the dominant methods for solving the exterior boundary value problems of Helmholtz's equation. The partial differential operator and the integral operators used in solving Helmholtz's equation are linear operators. The inverse problems of these problems, however, are nonlinear and ill-posed. In this talk, we will give a brief introduction to one of these problems. (Received February 03, 2015)