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2-dimensional Strauss conjecture for nontrapping obstacles. Preliminary report.

In this talk, we discuss our recent work on the 2-dimensional Strauss conjecture for nontrapping obstacles.

Recently, Hidano, Metcalfe, Smith, Sogge and Zhou proved the Strauss conjecture for nontrapping obstacles when the spatial dimension n equals 3 and 4. Their method is to prove abstract Strichartz estimates, including the $|x|$ -weighted Strichartz estimates.

In the Minkowski spacetime, the $|x|$ -weighted Strichartz estimates (also from the work of Fang and Wang) can be utilized to prove the Strauss conjecture with $n = 2, 3, 4$. The reason that they can only prove the general results for $n = 3, 4$ is that the abstract Strichartz estimates are proved only for the case with regularity $s \in [-\frac{n-3}{2}, \frac{n-1}{2}]$ (that is, $s = 1/2$ if $n = 2$). It seems that this restriction is essential for the general abstract Strichartz estimates.

In this work, we remedy this difficulty for $n = 2$ by proving the generalized Strichartz estimates of the type $L_t^q L_{|x|}^r L_\theta^2$. The corresponding problem for $n \geq 5$ are still open. (Received January 21, 2010)