

We identify a new way to divide the  $d$ -neighborhood of surfaces in  $\mathbb{R}^3$ . We decompose the  $d$ -neighborhood of surfaces into a finitely-overlapping collection of rectangular boxes  $S$ . We obtain an  $(l^2, L^p)$  decoupling estimate using this decomposition, for the sharp range of exponents. The decoupling theorem we prove is new for the hyperbolic paraboloid, and recovers the Tomas-Stein restriction inequality. Our decoupling inequality leads to new exponential sum estimates where the frequencies lie on surfaces which do not contain a line. In this talk, I'll focus on explaining backgrounds and theorems rather than giving proofs.