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On the DiPerna-Majda gap problem for 2D Euler equations

A famous result of Delort (1991) establishes the concentration-cancellation phenomenon for approximating solutions of 2D Euler equations with a vortex sheet whose vorticity maximal function has a log-decay of order $1/2$. On the other hand, DiPerna and Majda (1987) showed that if the log-decay assumption is strictly larger than 1 then the lack of concentration (and hence energy conservation) holds. Then the so-called DiPerna-Majda gap problem asks: concentration-cancellation vs. energy conservation in the remaining log-range $(1/2, 1]$?

In this talk, after reviewing earlier contributions to the DiPerna-Majda gap problem, I will present a new approach to this question based on sparseness.

This is based on joint projects with Mario Milman and Daniel Spector.