Some results on weak mixing

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Abstract: Avila-Forni proved that the vertical flow on almost every translation surface is weakly mixing. This talk will begin with the key criterion to rule out eigenvalues, the Veech criterion. From there it will address the two main results of this talk:

1) That there is a weakly mixing billiard (in a necessarily irrational) polygon and

2) The flow in almost every direction on a fixed translation surface is weakly mixing, unless the translation surface has a specific obstruction. In the presence of this obstruction the translation flow is not weakly mixing in any direction.

This is joint work with Giovanni Forni and Francisco Arana Hererra and Giovanni Forni.