INVOLUTIVE TRANSLATION SURFACES AND PANOV PLANES

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Abstract. Motivated by the work of Dmitri Panov, we introduce a new tool for studying billiard trajectories in infinite polygonal billiard tables, and particularly show how this tool can be used to study billiards in the periodic Ehrenfest wind-tree model. A key part of this analysis is the fact that the unfolded surface associated to the wind-tree covers a hyperelliptic surface. We then study the problem "in reverse," by starting with an involutive surface and showing how various Panov planes may be associated to it.