Meeting: 1003, Atlanta, Georgia, AMS CP 1, AMS Contributed Paper Session

1003-05-301 **Robert B. Ellis*** (rellis@math.tamu.edu), Department of Mathematics 3368, Texas A&M University, College Station, TX 77843, **Vadim Ponomarenko**, Trinity University, San Antonio, TX, and **Catherine H. Yan**, Texas A&M University. *The Rényi-Ulam pathological liar game with a fixed number of lies.*

The q-round Rényi-Ulam pathological liar game with k lies on the set $[n] := \{1, \ldots, n\}$ is a 2-player perfect information zero sum game. In each round Paul chooses a subset $A \subseteq [n]$ and Carole either assigns 1 lie to each element of A or to each element of $[n] \setminus A$. Paul wins if after q rounds there is at least one element with k or fewer lies. The game is dual to the original Rényi-Ulam liar game for which the winning condition is that at most one element has k or fewer lies. Defining $F_k^*(q)$ to be the minimum n such that Paul can win the q-round pathological liar game with k lies and initial set $[n]$, we find $F_1^*(q)$ and $F_2^*(q)$ exactly. For fixed k we prove that $F_k^*(q)$ is within an absolute constant (depending only on k) of the sphere bound, $2^q/\binom{q}{\leq k}$; this is already known to hold for the original Rényi-Ulam liar game due to a result of J. Spencer. (Received September 08, 2004)