

Baryshnikov, Yuliy**Wiener soccer and its generalization.** (English) [Zbl 0890.60075](#)[Electron. Commun. Probab. 3, 1-11 \(1998\)](#).

Summary: The trajectory of the ball in a soccer game is modelled by the Brownian motion on a cylinder, subject to elastic reflections at the boundary points [as proposed by *S. Kozlov, J. Pitman* and *M. Yor*, *Probab. Theory Appl.* 37, No. 3, 550-553 (1992); translation from *Teor. Veroyatn. Primen.* 37, No. 3, 562-564 (1992; [Zbl 0773.60079](#))]. The score is then the number of windings of the trajectory around the cylinder. We consider a generalization of this model to higher genus, prove asymptotic normality of the score and derive the covariance matrix. Further, we investigate the inverse problem: to what extent the underlying geometry can be reconstructed from the asymptotic score.

MSC:[60J65](#) Brownian motion[60J35](#) Transition functions, generators and resolvents**Keywords:**[Wiener process](#); [Brownian motion](#)**Full Text:** [DOI](#) [EMIS](#) [EuDML](#)