

Abstract Submitted
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Tie Goes to the Runner: the Physics and Psychology of a Close Play DAVID STARLING, Penn State University, SARAH STARLING, DeSales University — There is currently a push toward the multidisciplinary sciences at the undergraduate level to meet the changing nature of industry and academia. In this talk, we propose the game of baseball as a rich platform for studying the combination of physics and the cognitive sciences. In particular, we ask the question of how well an umpire can determine a close call at first base. Umpires must focus on two events: ball/glove and foot/base connections. From the physics perspective, we consider the transmission of information from these two events to two ideal detectors in an inertial reference frame. From the perspective of the psychologist, we relax the ideal detector assumption and consider the physical and cognitive limitations of a human umpire. Surprisingly, we find that standard umpire training techniques would fail for ideal detectors due to the large discrepancy between the speeds of light and sound. This would result in the runner being preferentially called safe (i.e., tie goes to the runner). On the other hand, the disparity in human processing time for sight and sound may counteract this effect, resulting in adequate precision. In this way, we find that baseball umpires are capable of making accurate calls within the horizon of simultaneity.

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