

GoalRef goal-line technology advances to final

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The GoalRef system developed by Fraunhofer IIS is a radio-based solution. Credit: Kurt Fuchs/Fraunhofer IIS

The International Football Association Board (IFAB) announced on Saturday, March 3, 2012, that it had shortlisted two goal-line technologies and approved them for a final round of testing. One of the remaining candidates is the GoalRef system developed by the Fraunhofer Institute for Integrated Circuits IIS, which is based in Erlangen, Germany. Fraunhofer IIS scientists are fielding a radio-based solution that tells the referee immediately whether or not a goal should be awarded.

In November and December 2011, the IFAB had eight different goal-line technologies trialed and assessed against a set of criteria defined by the Swiss Federal Laboratories for Materials Science and Technology (EMPA). Based on the results, two systems have now been selected for the next phase of testing. One of them is the GoalRef system developed by Fraunhofer IIS.

By producing low magnetic fields around the goals, GoalRef creates the radio equivalent of a light curtain. As soon as the ball has wholly crossed the goal line between the posts, a change in the [magnetic field](#) is detected. A goal alert is then instantaneously transmitted to the game officials

using an encrypted [radio signal](#), with a message displayed on their wristwatches. The system uses a very small and compact electronic device embedded in the ball manufactured by Select (Denmark). Fraunhofer IIS has developed the GoalRef technology in cooperation with the Danish company and is currently working towards [commercialization](#).

"Products based on the GoalRef technology have enormous potential. Beyond football, they can be used in other team sports at both professional and amateur levels," says project leader Ingmar Bretz.

Complementary to GoalRef, Fraunhofer IIS offers a supporting technology for match and training analysis: The RedFIR® system tracks all movements of the ball and players as they occur. By generating a real-time 3D visualization of match and training performance, it provides an objective basis for instant analysis and sideline feedback. Additionally, the information gathered can be used to enrich live media coverage.

The effectiveness of training sessions is further improved by the FitnessSHIRT: Sensors integrated in a shirt monitor the players' heart rates and breathing. The combination of these vital parameters with the RedFIR® location data help to maintain optimum training conditions. From March 6 to March 10, 2012, visitors to the Fraunhofer booth at CeBIT (booth E08, hall 26) will have the opportunity to learn more about all three systems.

Provided by Fraunhofer-Gesellschaft

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