

## SHOOTING ULTRA-SLOW MOTION FOR SPORTS IN CHINA

Higher frame rates allow broadcasters to highlight the finer details during playback.

By Xu Tong

Over the past few years, China's national TV network CCTV has been exploring some new production techniques for its sports coverage. In common with leading broadcasters around the world, CCTV places a high value on sports events and we work hard to make our coverage exciting, using the most advanced technologies available.

One technology in particular seems a natural fit for sports coverage: slow motion. Broadcasters have used slow motion in sports for decades as a way of letting the viewer see more clearly what happened when the action is too fast, but recent technical developments have opened up new possibilities for extreme slow motion in sports and other broadcast coverage. While traditional slow motion for TV has been achieved with conventional broadcast cameras and slow motion controllers, these have been limited to frame rates below 200fps. But with the advent of very high-speed video cameras originally developed for scientific use, that limitation was removed, and broadcasters were able to start exploring the potential of shooting the action at much higher rates. With the latest systems available today, rates up to 10,000fps can be achieved.

This really does give a different view of sporting action. Shooting at several hundred or thousands of frames per second allows the director to show not just a slowed-down version of what the eye saw at full speed, but a completely new level of detail from the action. Top-level sports always involve extremes of performance, as both the competitor and his or her equipment are strained to the limit of endurance, and it is this kind of detail that ultra-slow motion footage can highlight. You can show the instantaneous deformations and stresses that an athlete's equipment and body undergoes, in a way that traditional slow motion does not reveal. Any natural phenomena such as water splashes show up in the kind of striking detail usually only seen in movie special effect shots.

CCTV first started to work with ultra-slow motion systems at the 2004 Olympic Games in Athens, when the technology was still at an early stage of development. At that time, the system we used was not fully adapted for use in a broadcast environment and although it was a worthwhile experiment, the results were not as



China Tennis Open 2010

good as we have been getting at more recent events, using the I-MOVIX SprintCam system. This is based on Vision Research Phantom cameras but the cameras are only a part of the entire system, which is designed to make them easily usable in a broadcast environment. These ultra-slow motion cameras lack a lot of the features that are essential for use in a live broadcast environment, so they have to be adapted as part of a broadcast-integrated system.

The I-MOVIX system provides all the necessary input and output options, together with a central processing/control unit, a hard disk recorder, and control surfaces/panels for operating the camera and replay. Most importantly, the system has a look and feel that is instantly familiar to a broadcast crew, and our personnel found it easy to operate under the pressure of live production. This means that little or no special training is required, and we don't need to dedicate specialist slow motion crews to operate the system. The latest generation of cameras used in the SprintCam system also produce image quality as good as standard broadcast cameras, so it means that the system can easily be used to provide

'normal' coverage as well as ultra-slow motion replays.

We first used the SprintCam for our coverage of the 2010 China Tennis Open, the 12th edition of the tournament held at the Olympic Green Tennis Center in Beijing. With the collaboration of I-MOVIX's local partners Instrimpex INSTEC, we incorporated a SprintCam Vvs HD system into our setup for the event, and used it to deliver many ultra-slow sequences of the players in action. These sequences were a big highlight of our coverage and gave it a new dimension which appealed strongly to the audience.

As an autocross director at CCTV-5, I think that this system brings us the best experience in our program. It can provide timely real-time images for every group of racing moments, with clear image quality and shocking intensity. Due to the fact that this system has extreme requirements for environment light, we should have special production concepts and operation skills which are different from previous generation slow motion technologies. [ASIAIMAGE](#)

*Xu Tong is program director at CCTV-5.*