

# APPLICATION OF HIGH SPEED PANNING ON THE TECHNICAL ANALYSIS OF POLE VAULT

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**KEY WORDS:** high speed panning, pole vault, takeoff technique

**INTRODUCTION:** The pole vault is an event with the characteristics of a complicated technical movement and a large motion space. Generally, its field of view needs a near 10m horizontal shooting scope and an above 6m vertical shooting scope. The factors such as the edge distortion should be also considered. If the fixed photography of 16mm high-speed camera is used, the image formation is too small to read photographic images. Therefore, the high speed panning of a 35mm camera has been used to record the performance of an elite Chinese pole-vault athlete. On the basis of the shooting film of his movement in competitions, a biomechanical analysis and diagnosis have been made in order to put forward constructive suggestions for the coach and athlete to assist with specific training to improve technique.

**METHODS:** LBS-500 Type 35mm high speed camera and the horizontal high-speed scan panning were used for shooting the performance of one Russian and one Chinese elite pole vault athlete at the 92 Jinan International Invitational Tournaments of Indoor Track and Field, China. The camera speed is 100F/s and the camera and the motion level vertical distance is 38m. The rotation angle of the main optical axis from left to right and from top to bottom is less than 20°. The scale used is a special 7m folding ruler in black and white check. The data was calculated using specific analytical software (China). The data smooth adopts digital filtration and the frequency was 7. The shooting height was 5.10m for the Chinese athlete and 5.30m for the Russian athlete.

**RESULTS:** On the basis of analytical results during the phase of run-up and takeoff, the average run-up speed in later 5 meters for The Chinese athlete is 9.35m/s. This result reached the level of elite athletes but the takeoff speed lost too much. Due to the lost horizontal speed during takeoff when jumping for 5.30m, it has been shown on the basis of analytical results of flight phase that his horizontal speed was nearly zero when his body center reached the highest point. This resulted in hitting the bar when the body was falling. It has shown that the time elapsed in the movement is unreasonable based on the analytical result of every phase of flight.

**CONCLUSION:** It is an ideal method to make an analysis of pole vault technique with 35mm camera for horizontal scan panning.

1. The run-up speed of elite Chinese pole-vaulter reached the world level. However, due to his technical problems during takeoff, his takeoff speed lost too much to complete his follow-up movement adequately.
2. Discrepancies exist in every phase of this athlete's flight movement.