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#### 我国优秀男子撑竿跳高运动员杨雁盛最后两步助跑至插穴起跳技术的运动学跟踪研究\*

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**摘要:** 以我国优秀撑竿跳高运动员杨雁盛的技术为研究对象, 对其2006-08—2007-08 份所参加的各次大赛技术进行跟踪研究, 运用文献资料法、专家访谈法、生物力学测量法、数理统计等方法, 对选取的主要指标进行运动学分析。研究结果表明杨雁盛最后两步助跑至起跳身体重心水平方向速度损失过大, 垂直方向速度增值过大, 从而造成起跳垂直分力过大, 致使腾起初速度减小, 但整体赛次起跳阶段重心腾起角度保持较好, 符合撑竿跳高对起跳腾起角的技术要求; 步幅和步频基本符合撑竿跳高最后两步步长变化的技术要求; 起跳离地瞬间摆动腿髋角偏小, 但大小腿折叠角度基本符合撑竿跳高技术要求; 起跳点位置偏近是起跳效果欠佳的主要原因。

**关键词:** 撑竿跳高; 最后两步助跑; 起跳; 运动学分析

#### The Kinematics Follow-up Research on Final Two Steps to Take off Technique of Yangyansheng, one of the Elite Chinese Man Pole-vaulters

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**Abstract:** What Was Put Under Study In This Paper Is The Pole Vault Technique Of One Of Outstanding Chinese Athletes — YangYanSheng When He Participated In The Contest During August 2006 Till August 2007. His Final Two — Step Approach And Take Off Characteristics Were Analyzed To Expose The Problems In The Pole Vault. It Aims To Provide Scientific Training For The Days To Come. Methods Like Literature Consultation, Expert Interviews, Biomechanical Measurements And Mathematical Statistics And Are Employed To Combine With Kinematics Analysis. The Results Show That During YangYanSheng's Final Two — Step Run — Up Till To Take — Off, The Loss Of Speed Of The Center Of Gravity Is Substantial With The Addment Of Vertical Velocity To Be Too Much. This Directly Results In Decreases In Initial Speed. It Is However Found That During The Overall Take — Off Stage Center Of Gravity Flight Angle Was Well — Maintained, Which Meet The Technical Requirements Of Pole During Take — Off Phase. It Is Particularly Desirable To See That Stride And Cadence Being In Line With The Basic Pole Vault At The Last Two — Step By Step, Yet Folding Angle Between Upper And Lower Legs Is Desirably Proper To Meet Pole — Vault Requirement. Hip Angle Of Swinging Leg At The Moment Take — Off Maintain Rather Small. Meanwhile, The Basic Point Of Collapse Calf Pole Vault Meet With High — Tech Requirements. It Is Obvious That With Take — Off Position Being Too Close To The Bar, It Is Hard To Realize Efficient Take — Off.

**Key Words:** Pole Vault; Final Two — Step Approach; Takeoff; Kinematic Analysis

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