

Jumps Applied Session

Written by LM

Friday, 18 March 2011 10:33 - Last Updated Wednesday, 01 June 2011 11:42



Track and Field – Jumps Applied Session @ ISBS 2011

(Biomechanical implications on Jumps Performance)

Aim

The aim of this session is to look at the biomechanical knowledge on jumps and use it to (i) analyze how this knowledge can be used to improve the performance on jumps in general and particularly on long jump; (ii) promote an open discussion with researchers, coaches, clinicians and practitioners about this findings, and (iii) use this information to design new approaches to research projects, equipment development and new training methods.

The theoretical foundations

Currently, athletes are working close to their biological limits and the pre-requisites for success in these events are the large amount of mechanical energy and forces that the athlete faces during the entire movement. Therefore, an issue to be addressed is the high risk of injuries of the muscle skeletal system and the contribute that biomechanics can offer to prevent it and optimize the training. There is great inter and intra variability on jumps technique and despite efforts spent by biomechanicists, many efforts still to be done to thoroughly address for a comprehensive explanation.

Although knowledge has been growing during recent years, little have been done concerning take-off in track and field jumps as well as the dynamics of muscle-tendon unit during this phase. Through force platforms, insights about the mechanics of vertical and horizontal jumps during take-off can be understood, although little can be found in the literature. The knowledge of the GRF pattern together with kinematic information will enable a more thorough evaluation of the jumper technique and efficiency. Another challenge for biomechanics is to provide timely and meaningful information to coaches and elite athletes. With the development of new technologies more accurate data can be gathered from different systems and information delivered faster for athletes and coaches and other approaches can be developed as well.

Programme

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28 June 2011

Track and Field – Indoor facilities - 15h30
Data Collection in Long Jump (Chairman Prof. Filipe Conceição)



Invited Athletes

Naide Gomes: World Indoor Champion

Best Performance: Long Jump - 7.12m

Gaspar Araujo

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OUTDOOR

2004 European Team Champion (Turkey) LJ – 8,15m (v) 8,10m (1st)

Considered the best male jumper of the event

Athens Olympic Games-L J – Did not reach the final

2005 European Champion Clubs Cup (Sporting Club Portugal) - 7,91m (1st)

2008 Ibero-American Championship (Chile) - 7,83m (1st)

INDOOR

2005 – Madrid Meeting - LJ 8,00m (2nd)

European Indoor Championship (Madrid) - L J – 7,85m (5th)

Best male athlete of the Portuguese team in this championship

Marcus Caldeira

2005 European Youth Olympic Day (Italy) -7,34m (Youth Nat Record);

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Euro Asian Games (Thailand);

World Youth Championship (Marrakech) (13th);

2007 European Juniors Championship (3rd);

National Juniors Indoor Record - 7.58 m;

2009 Triple Jump Best Performance - 16,19 m.

2011 Long Jump Best Performance - 7,81m.

Athletes Preparation and Familiarization with equipments and procedures, in parallel with:

Establishing the main focus in data collection (20'):

Prof. Brüggemann

Prof. Mark King

Prof. Nick Linthorne

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Data Collection - Long Jump Run-Up, Take-off and Aerial Phase (45'):

Measurement of approach run velocities, three dimensional measurements of athletes' performance

and ground reaction forces during take-off and during the aerial phase.

Data Projection for the participants (15')

Room - 15h30 (Chairman Prof. Filipe Conceição)



1st Oral Presentation (20')

Prof. Nick Linthorne: *Take-off forces and impulses in the long jump*

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2nd Oral Presentation (20')

Prof. Mark King: *Computer simulation of the takeoff phase in running jumps*

3rd Oral Presentation (20')

Prof. Gert-Peter Brüeggemann: *Association of muscle-tendon mechanical properties and jumping performance - some biomechanical considerations*

4th Oral Presentation (20')

Prof. Filipe Conceição: *Presentation of the jumps' data collected*

Debate (10')

Presenters Biographies

Gert-Peter Brüggemann, DSK, German Sport University, Cologne, Germany.

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Dr. Brüggemann currently is a Professor at the German Sport University, Cologne, Germany. His original



Mark King, Loughborough University, UK Kin Sports Biomechanics at Loughborough University, UK, research

- Computer simulation of dynamic jumps
- Maximal voluntary isovelocity torque
- Computer simulation of racket sports
- Computer simulation of fast bowling in cricket

The main focus of my current research is using subject-specific computer simulation models to help und

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Nick Lind - Senior Lecturer in Sports Biomechanics at Brunel University, UK. His original training was in physics.



Filipe Conceição - University of Porto, Portugal. He received his PhD from the Faculty of Sport of Porto University and completed postgraduate studies in Biomechanics.



Silve - University of Porto, Portugal. He received his PhD from the Faculty of Sport of Porto University and completed postgraduate studies in Biomechanics.