THE INFLUENCE OF SPRAINO ON PERFORMANCE AND SAFETY IN BADMINTON

BREAKING NEW GROUND
AALBORG UNIVERSITY

6TH WORLD CONGRESS OF RACKET SPORT SCIENCE
BANGKOK 2018

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The influence of Spraino...

Lateral ankle sprains

- Ankle sprains are <u>extremely</u> common!
  - Most common site of injury[1,2,3,4,5,6]
  - 86.5% of a lateral nature[1,2,3,4,5]
  - Lateral ligament complex most frequently injured structure[3,4,5]
  - Accounts for 1/6 of all injury lay-off[2,5]

>30%

- May result in long term problems
  - <u>Up to</u> 40-50% may suffer from *chronic ankle instability*[1,5,6]

[1]Verhagen & Bay, 2010; [2]Wright et al., 2000; [3]Garrick, 1977
[4]Fong et al., 2007; [5]Gribble et al., 2016; [6]Vuurberg et al., 2018

Lateral ankle sprains

- **<u>Indoor sports</u>** responsible for the highest incidences of lateral ankle sprains[1,4,5]
  - Typically <u>Non-contact</u> injury![1,4,5]
  - Especially predominant in:
    - Handball[1,4]
    - Basketball[1,4]
    - **Badminton**[1,4,5]
- *24.3% of ALL lower extremity injuries*[6]

29.5%[2]

- *"**Shoe-wear** and playing court surface are important factors for further analysis" (Fahlström 1998)*

[1]Gribble et al., 2016; [2]Fahlström et al., 1998
[3]Doherty et al., 2013; [4]Fong et al., 2007; [5]Kaldau, 2018; [6]Shariff et al., 2009


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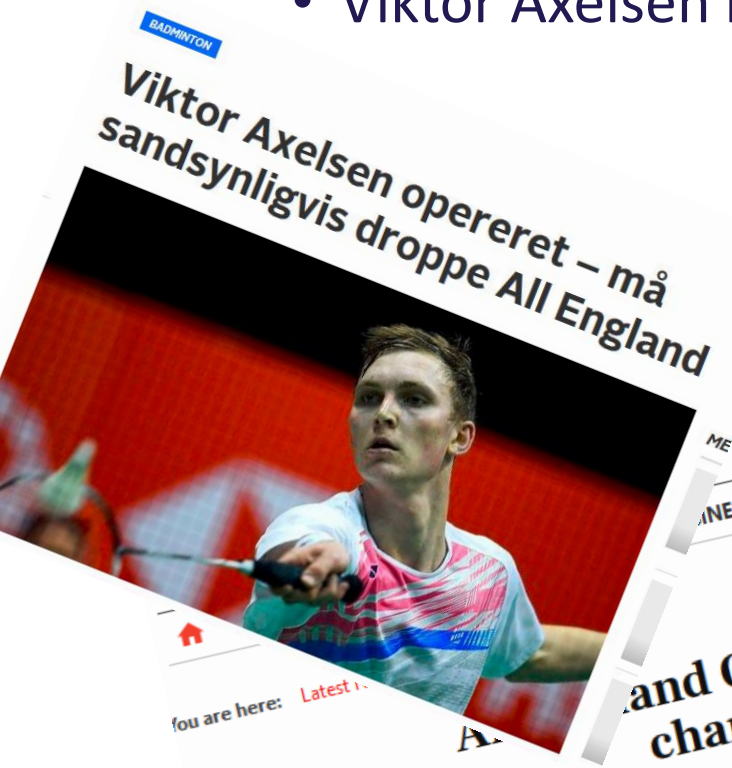
Lateral ankle sprains

- May result in long term problems
  - Up to 50% will suffer from *chronic ankle instability, recurrent issues etc.*
  - Viktor Axelsen having problems 1 year after initial ankle sprain…



Best practice

“Based on current evidence, a combination of an external prophylactic measure (tape or brace) with neuromuscular training will achieve the best preventive outcomes with minimal burden for the athlete”

(Verhagen & Bay, 2010)

Usual practice

- A national survey among 504 sub-elite indoor sports athletes revealed a poor to none-existing use of currently available preventive strategies…
  - Despite all of them having regular ankle problems and recurring incidences!
  - *Especially the case among badminton players!*
  - *Limitation to performance and comfort*

(Lysdal et al., (unpublished))

Spraino – Next practice?

- *The idea of minimizing friction on the lateral edge of a shoe*

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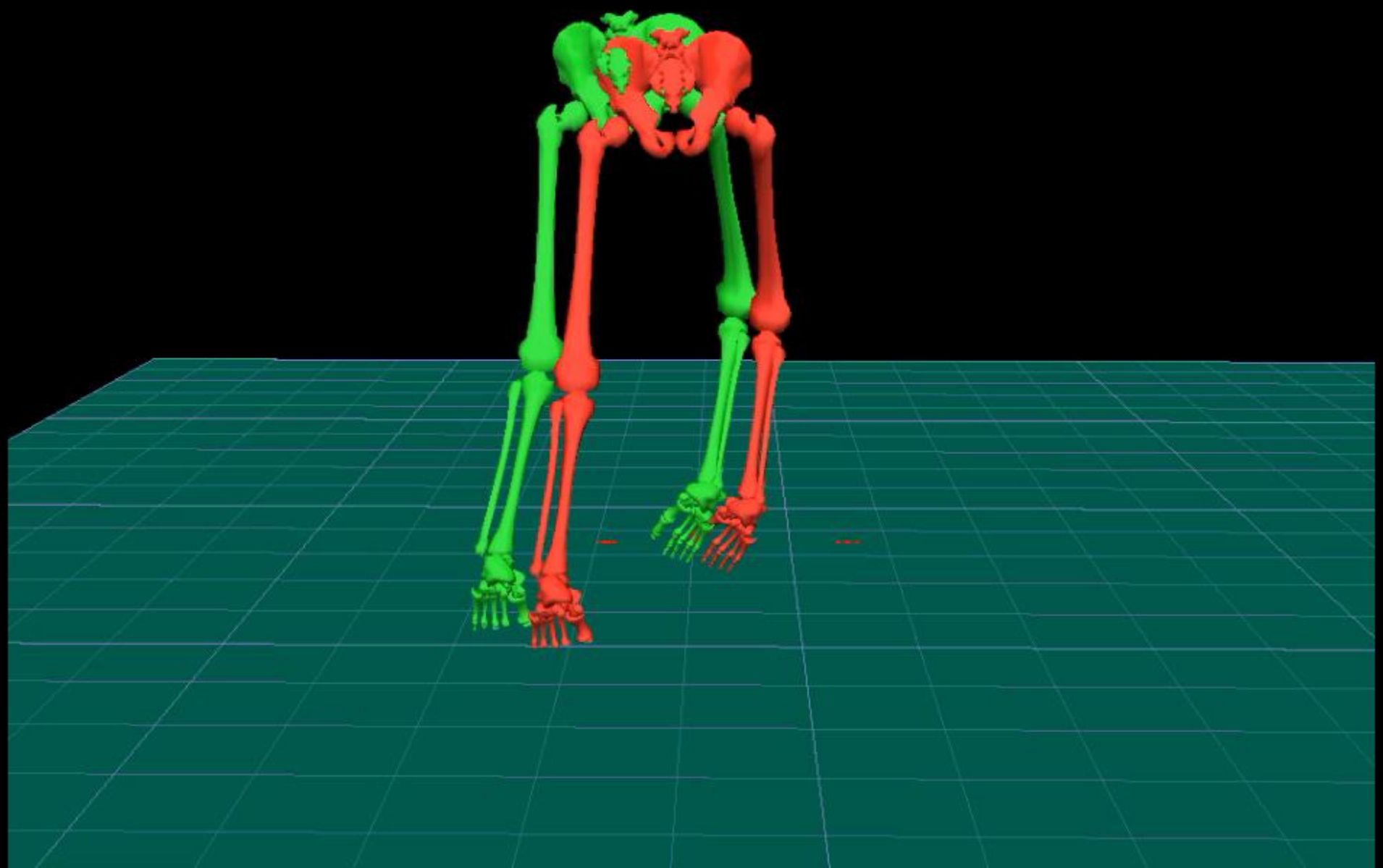

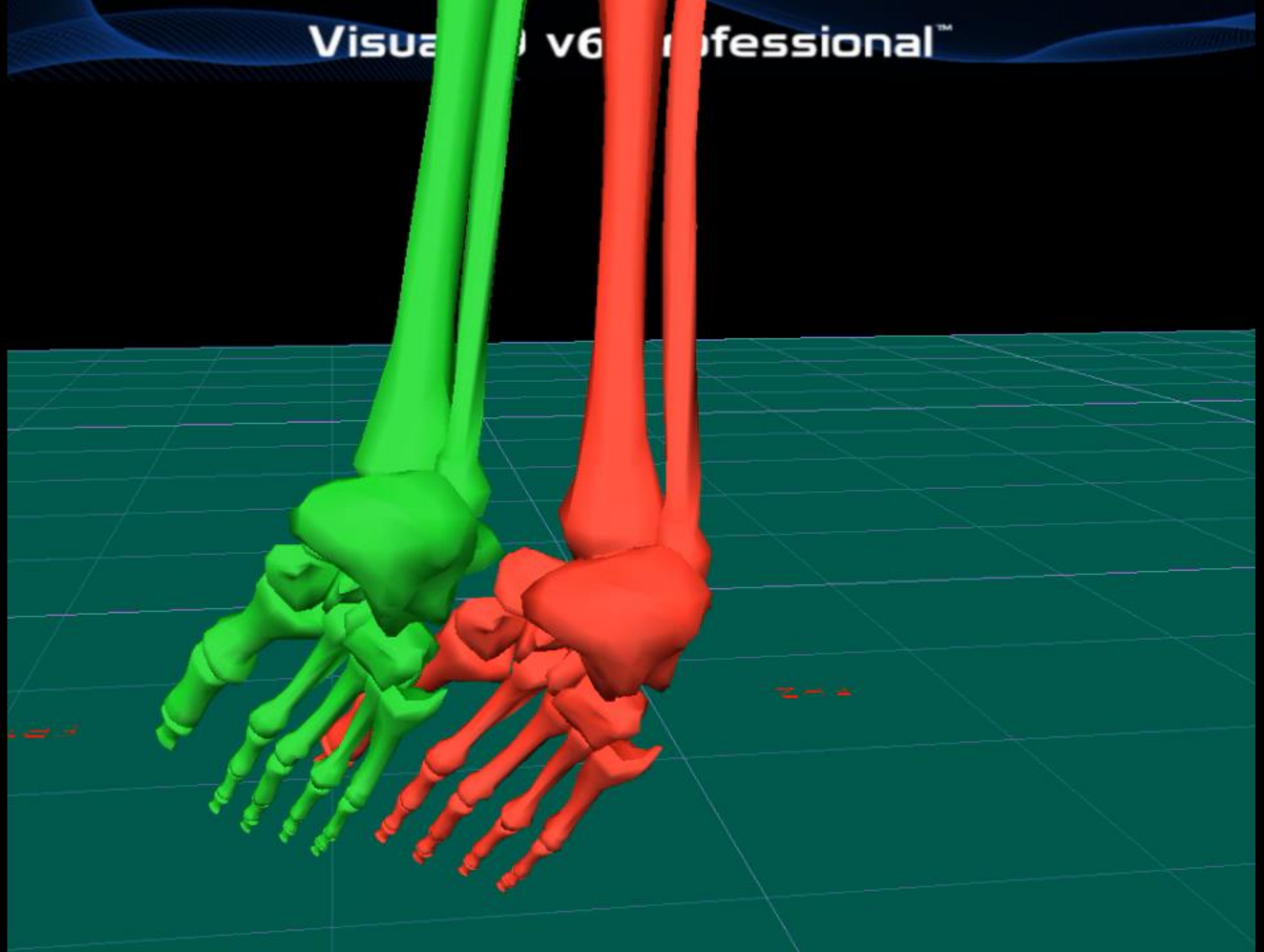
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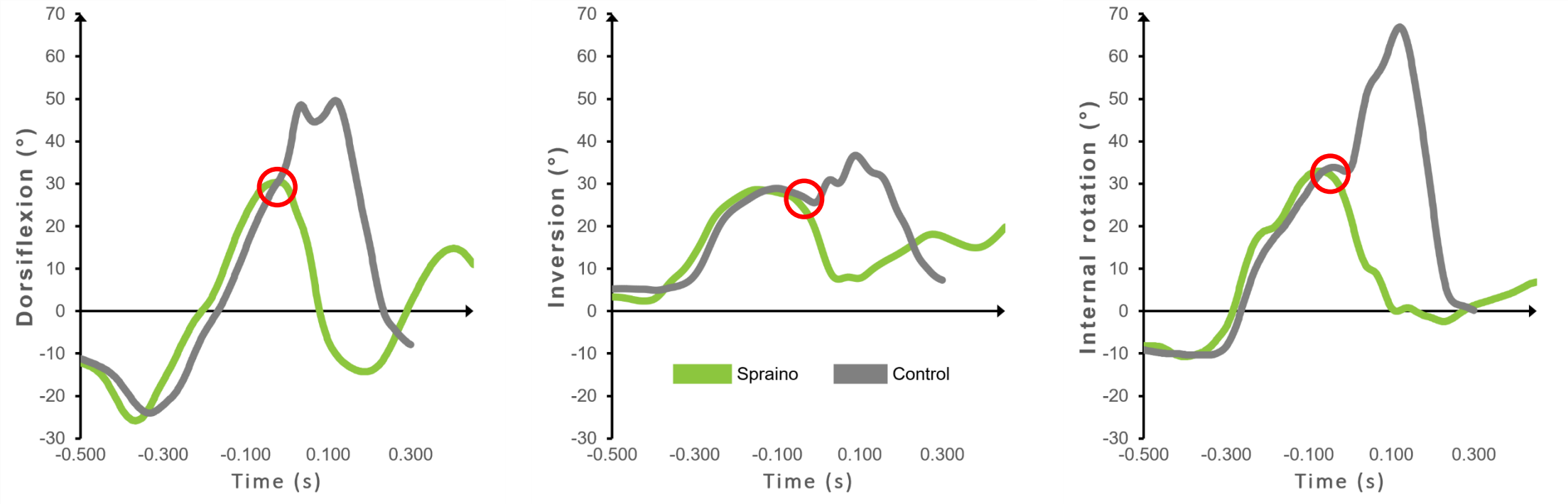
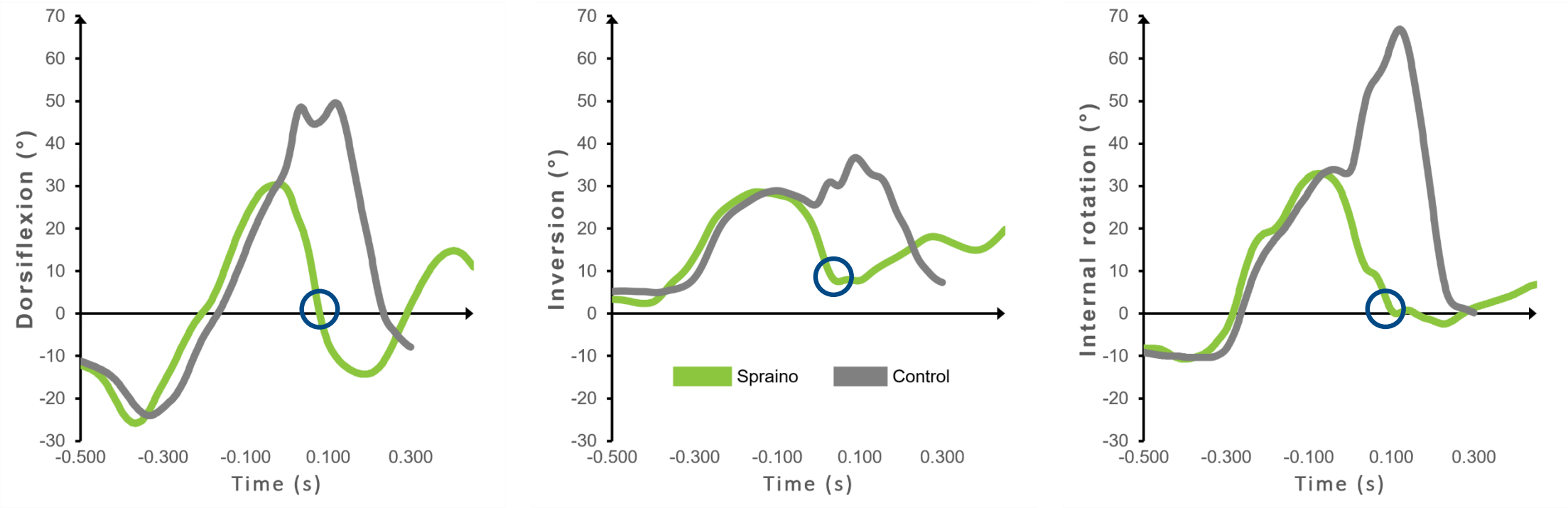
Spraino – Next practice?

= Initial ground contact



(Lysdal et al., 2018)

Spraino – Next practice?



Minimizing friction on the lateral edge of a shoe <u>can</u> prevent non-contact lateral ankle sprains

(Lysdal et al., 2018)

Effect on Badminton Performance

- Friction fundamental to performance?
  - Yes, (but) only until a friction coefficient of 0.82[1]

- *Can Spraino be used without reducing performance of simulated badminton matchplay?*

(Luo & Stefanyshyn, 2011)

Effect on Badminton Performance

- Twenty-one international badminton players participated in the study:
  - Thirteen males (age: 22.3 ± 4 y height: 1.79 ± 0.07 m, mass: 72.1 ± 7 kg)
  - Eight females (age: 21.6 ± 3 y height: 1.65 ± 0.07 m, mass: 58.7 ± 7 kg)

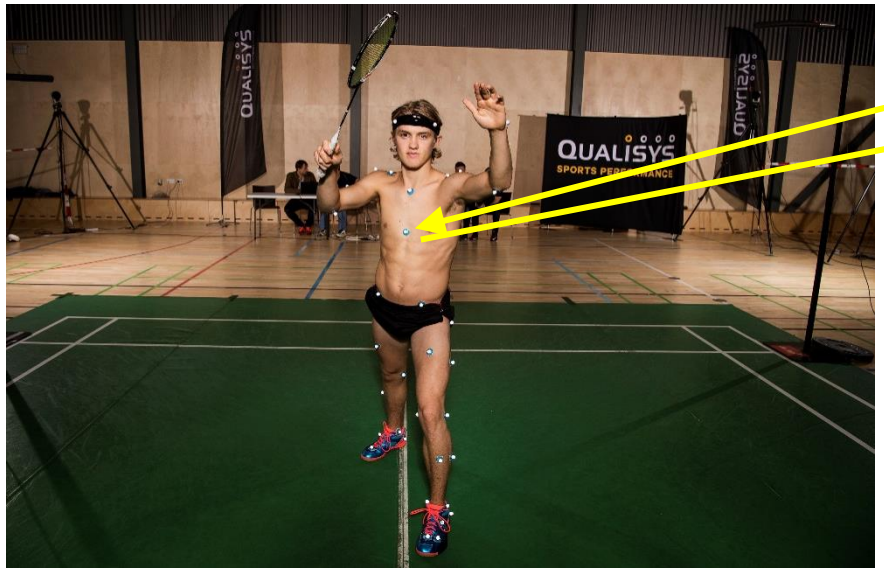
- Performed the Møller Speed Test (BST)[1] two times in two different conditions in a randomized crossover design
  - *With and without minimized lateral shoe-surface friction*

([1]Madsen et al., 2015)

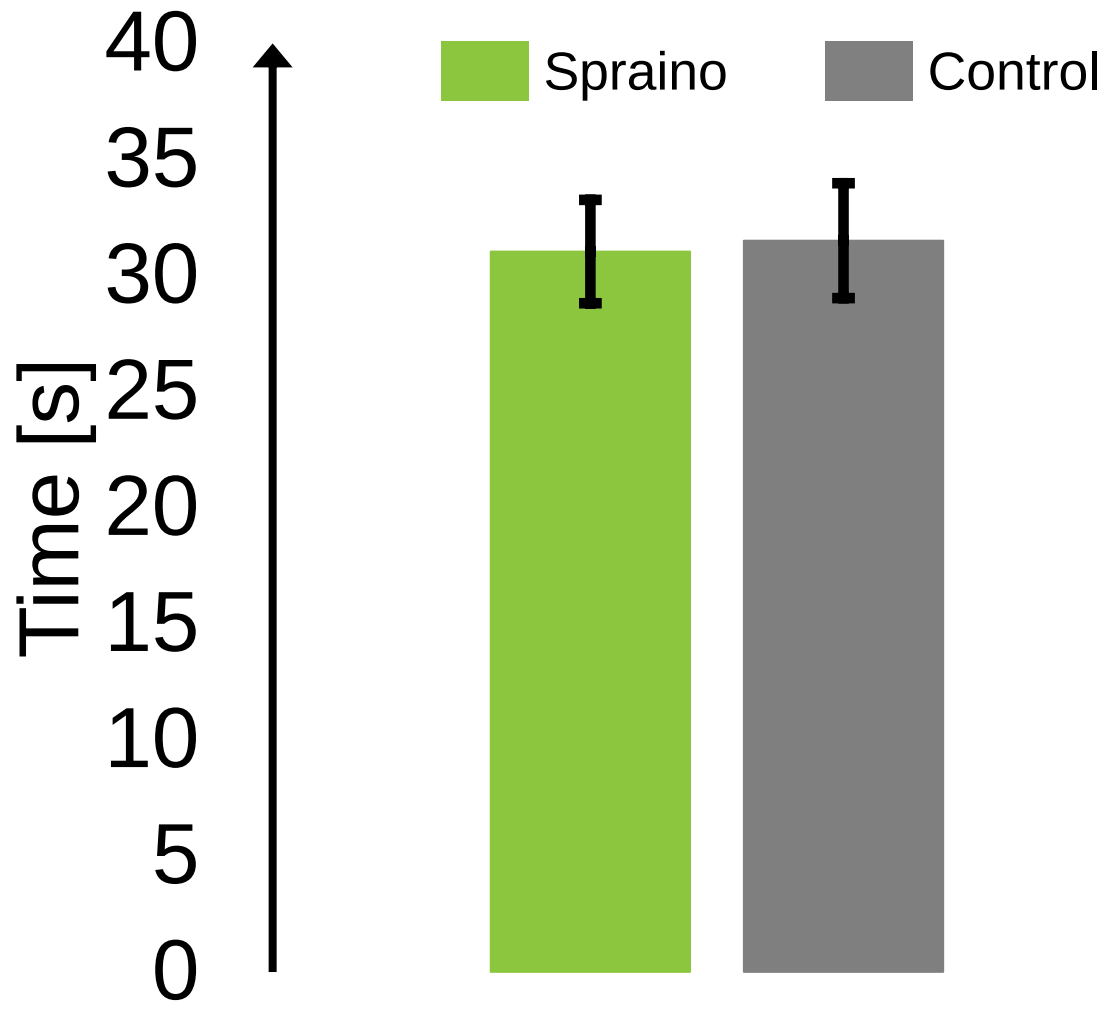
Effect on Badminton Performance

- Kinematic data
  - 66 markers
  - 240Hz
  - 16 highspeed infrared cameras (Oqus 700+, Qualisys AB, Gothenburg, Sweden)

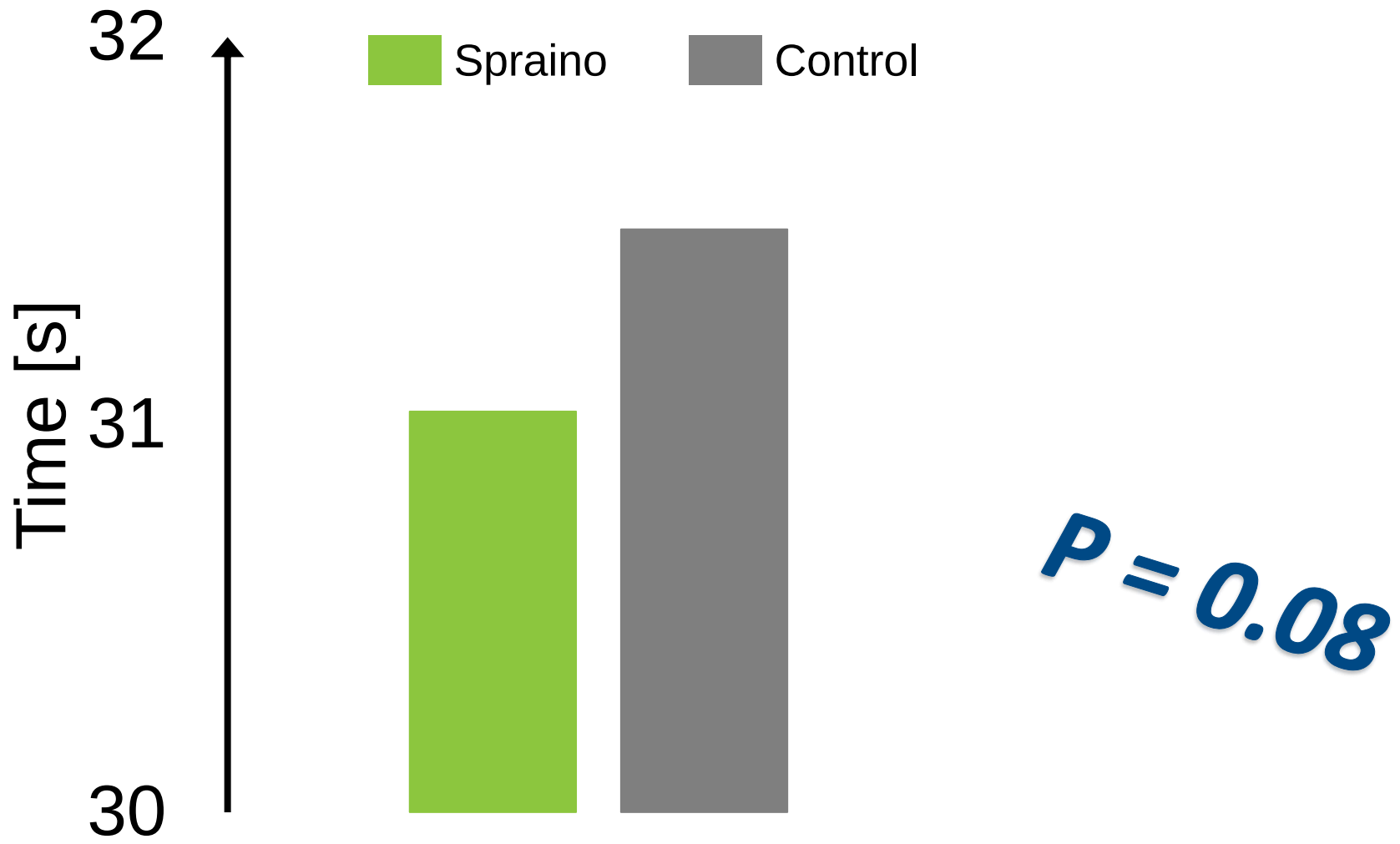
- Lower extremity joint kinematics were analyzed using Visual3D (C-Motion Inc., Maryland, USA)



Effect on Badminton Performance



Effect on Badminton Performance



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Effect on Badminton Performance

- Biomechanics of the badminton **forward lunge**
  - *Test if Spraino affects performance*
  - Essential part of badminton[1]
  - Produces high shoe-floor shear stresses (friction)[1]
  - **Backhand forward lunge** *(Backhand lob)*
    - Highest degree of initial ankle inversion (initial lateral contact)

(Smith and Lees, 1994)


CHENGSAN KAKI
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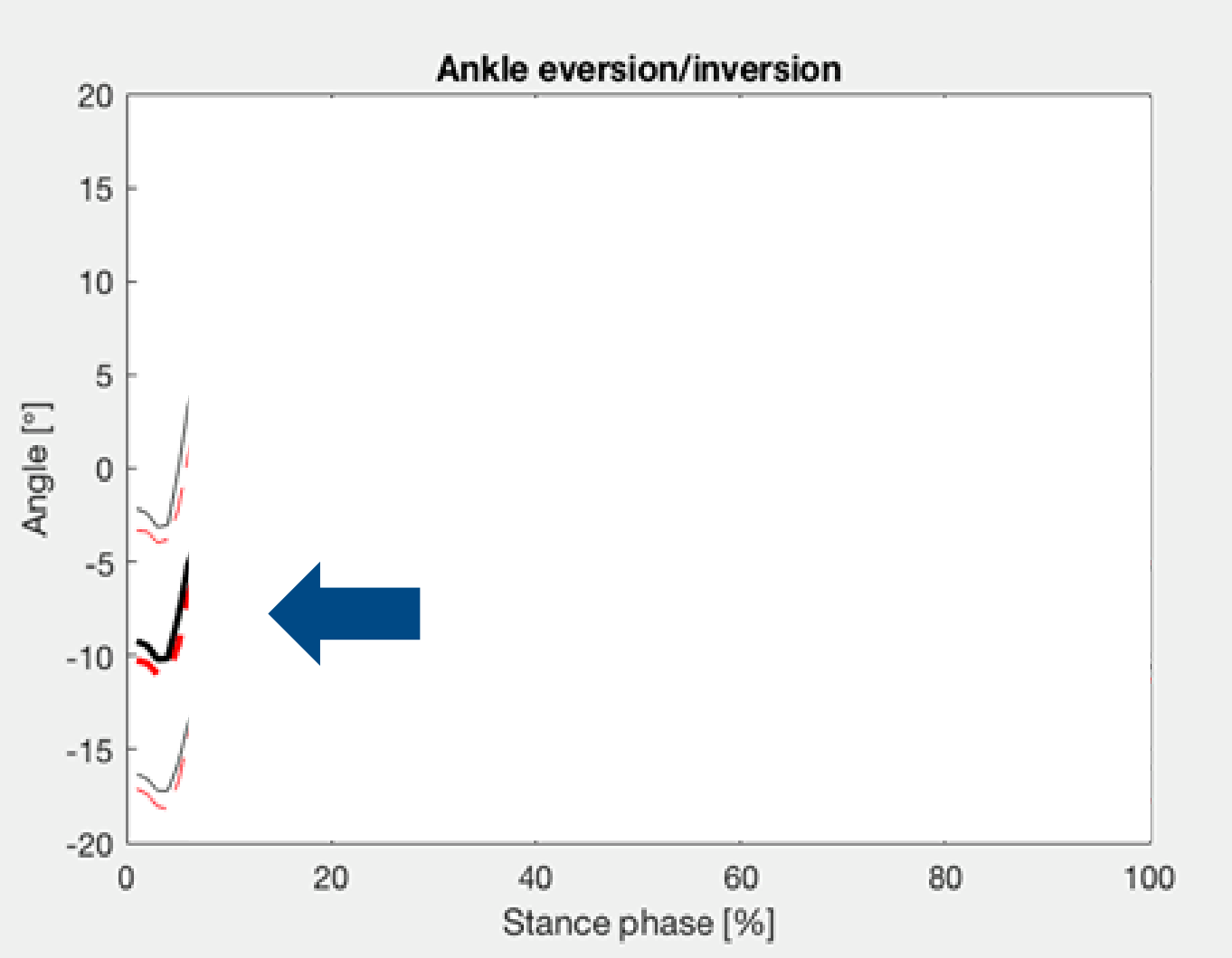
Effect on Badminton Performance



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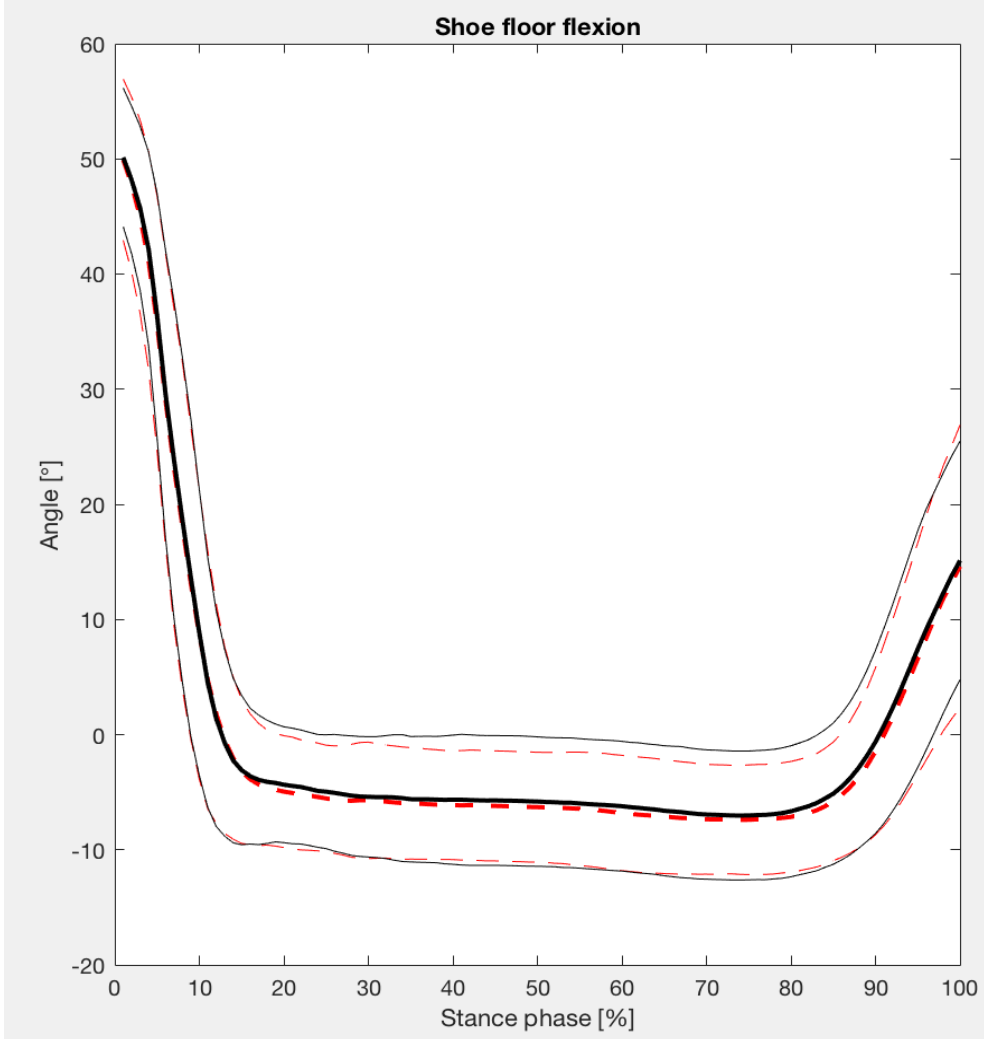

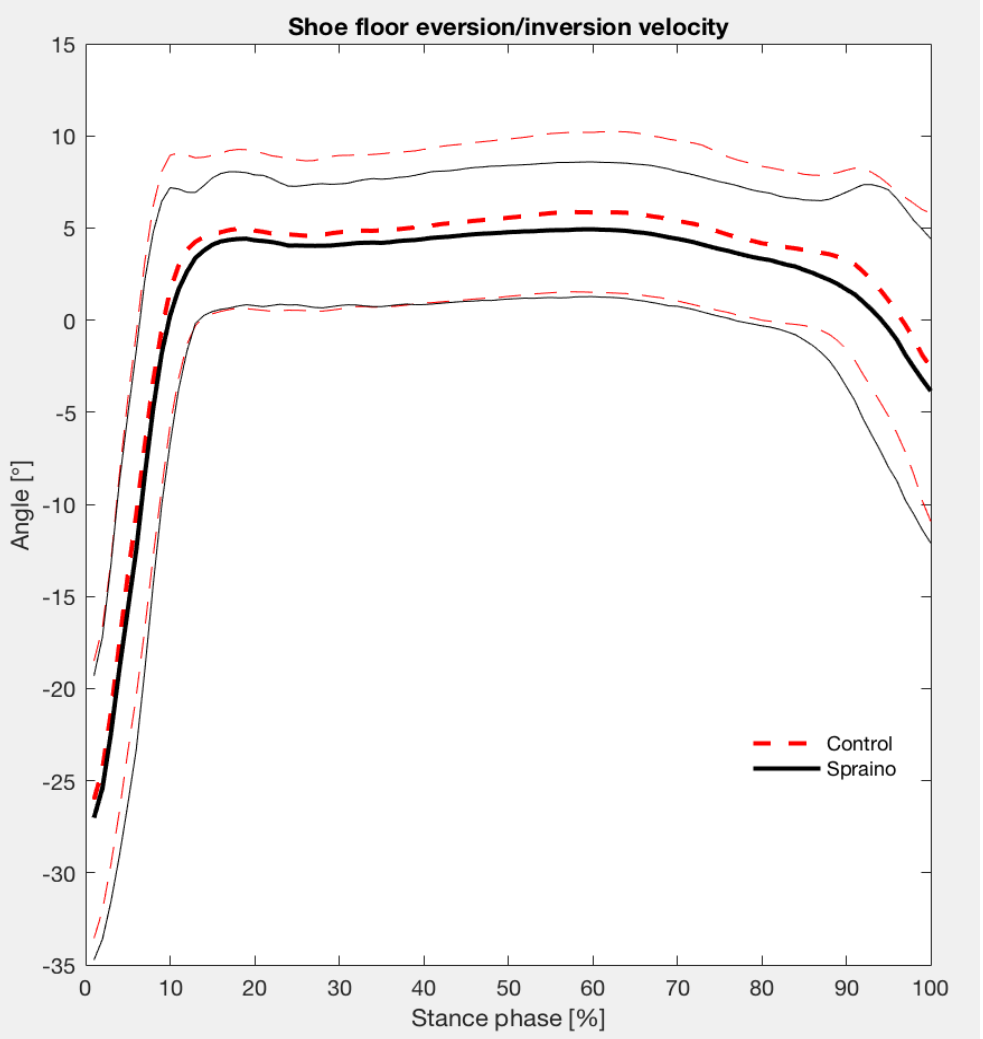

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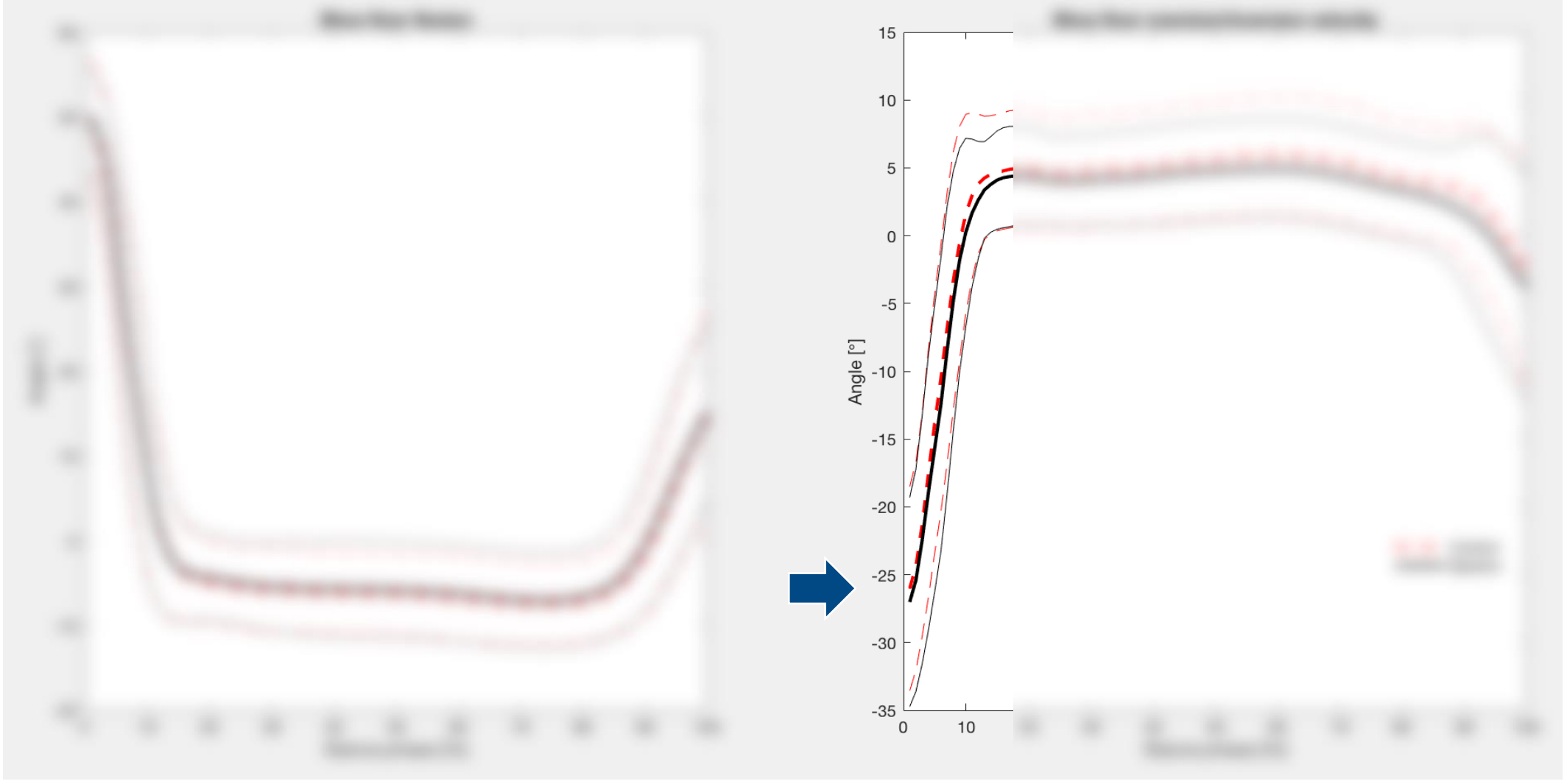

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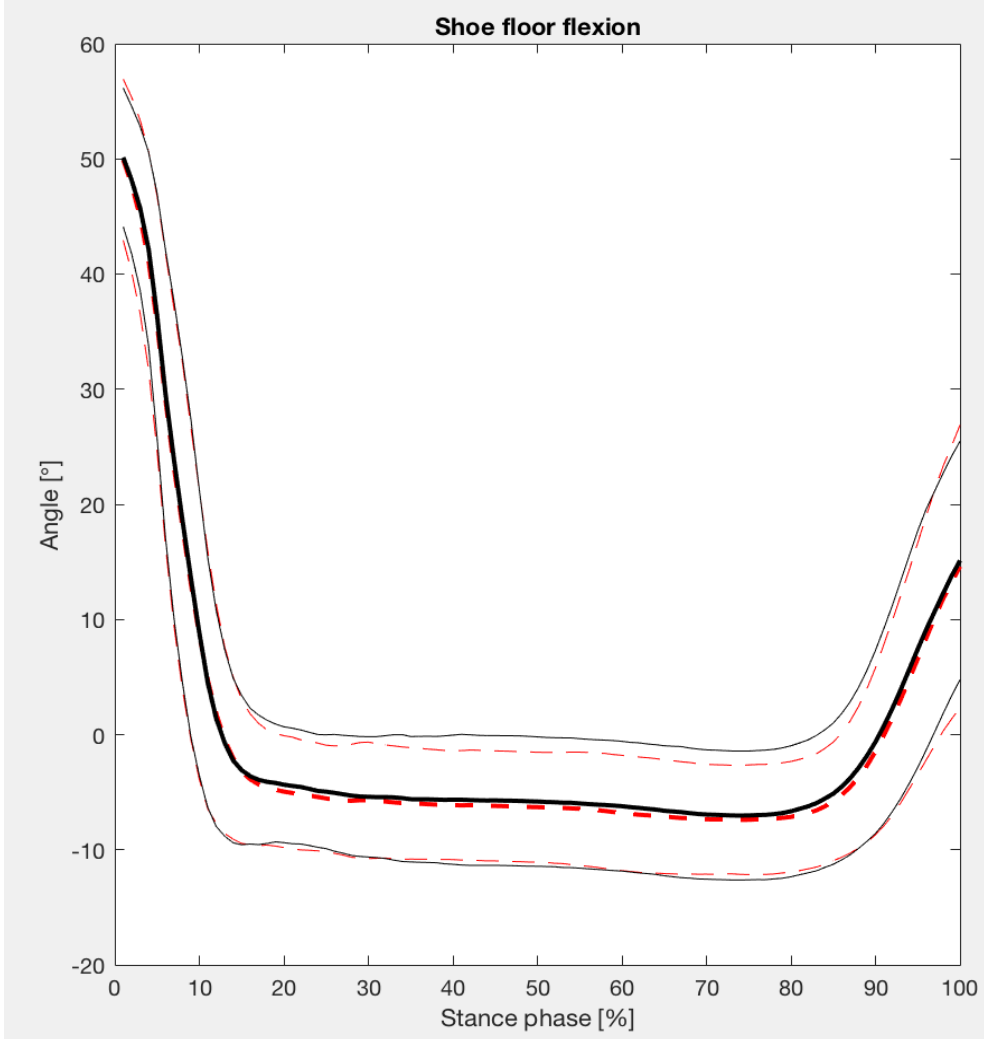

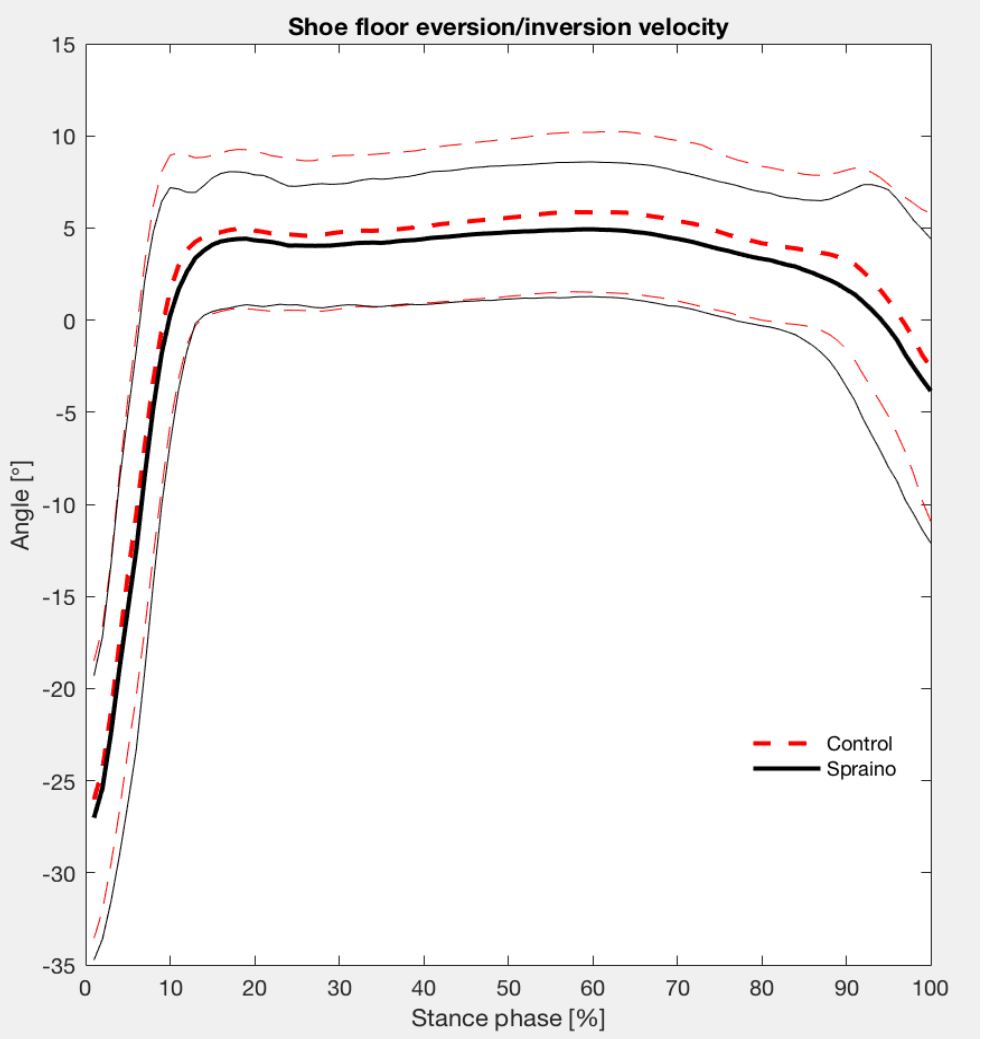

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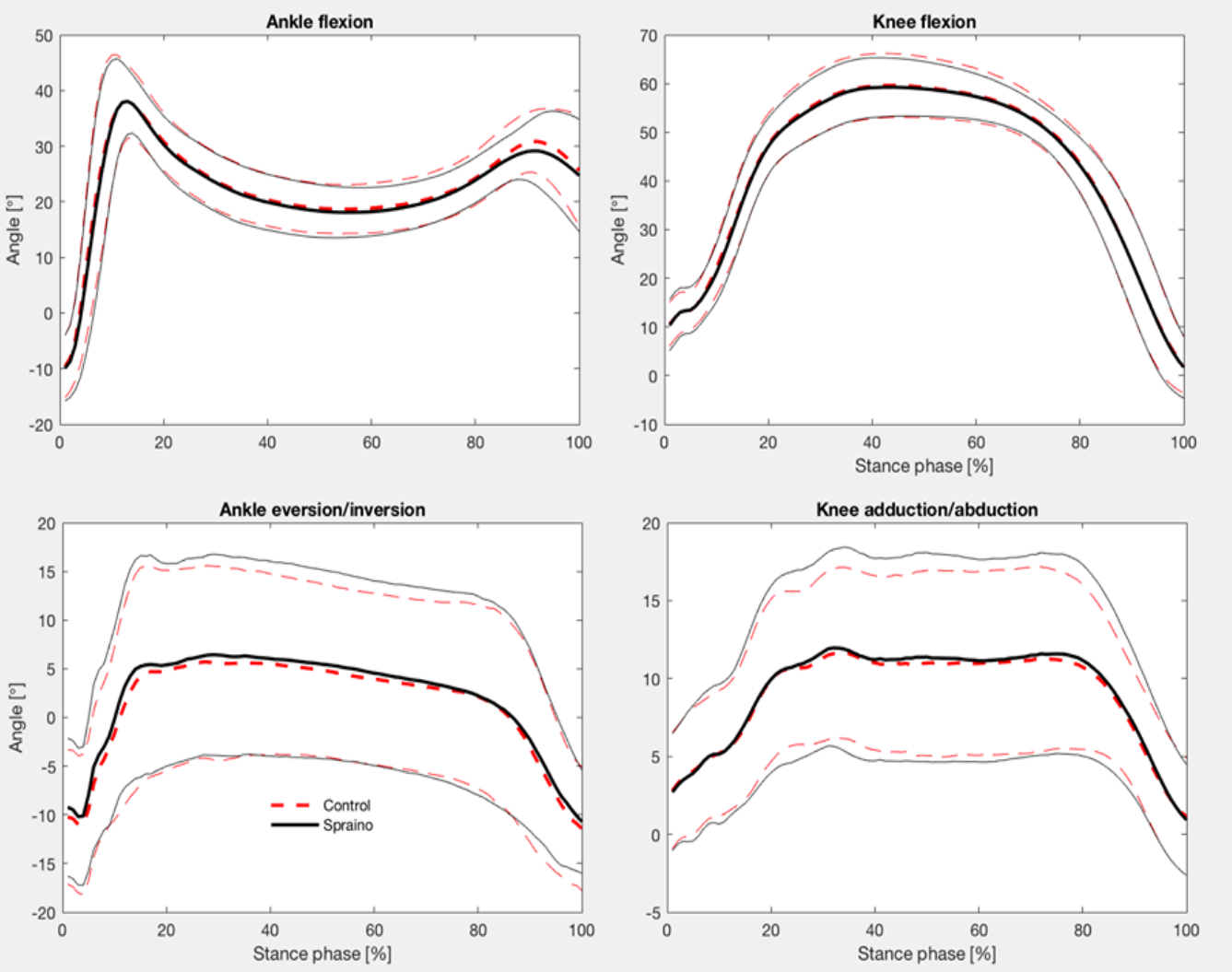

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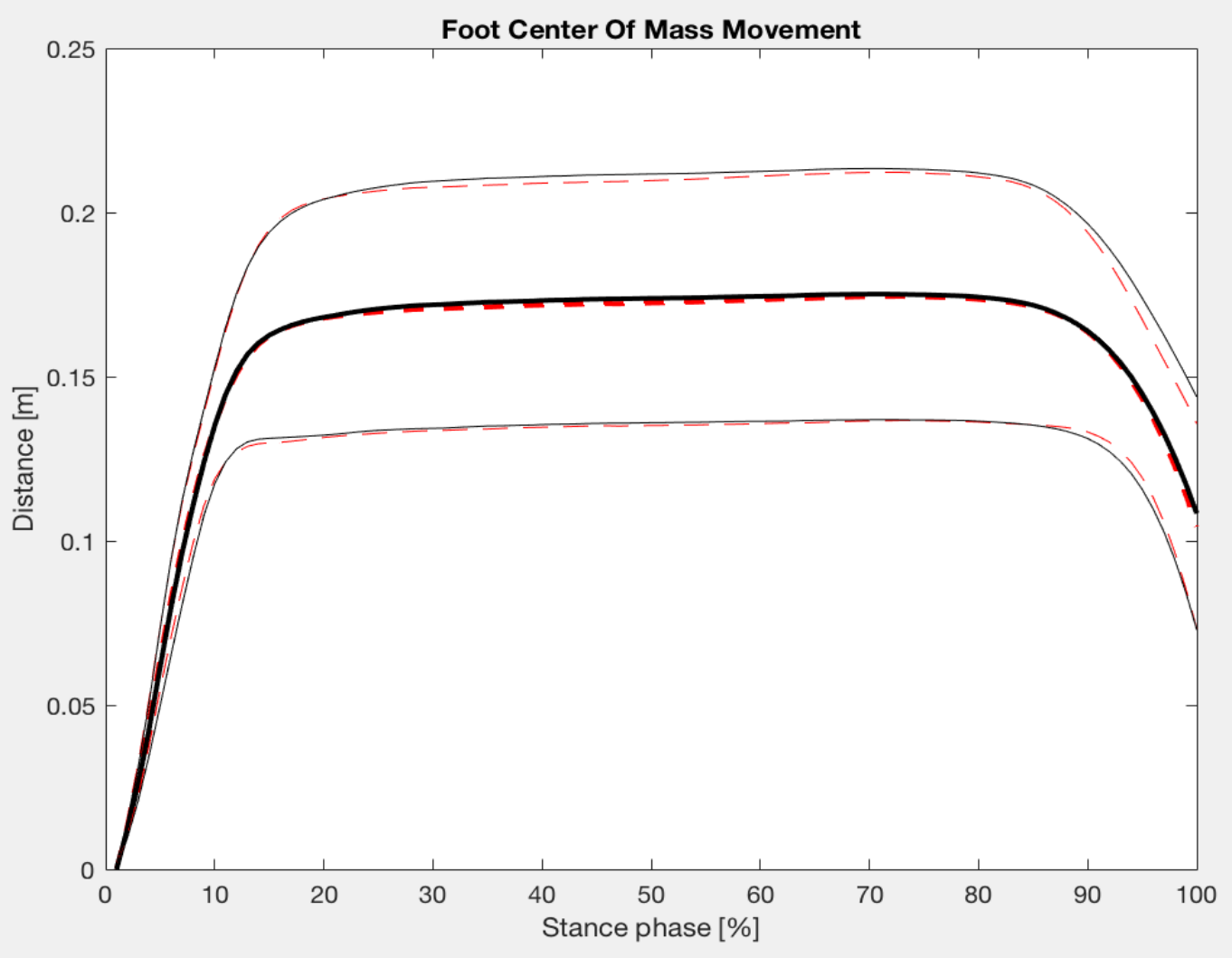

Conclusions

- ***Spraino does not have a negative effect on badminton performance***
  - *Tendency towards a faster completion time*

- ***No reduction in traction***
  - *Spraino does not reduce friction during backhand forward lunging (backhand lob)*
    - *despite initial ankle inversion*

- ***No adverse effects observed***

Conclusions

The trend towards a faster completion time highlights, that Spraino may be effective when used to prevent ankle sprains in badminton, without affecting performance and safety

Thank you for your attention!

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