Game demands and fatigue profiles in elite football – an individual approach

-Implications for training and recovery strategies

Main aims with physical training in elite football

1. Keep the players on the pith (free from injury)

2. Prepare every individual player for their individual physical game demands

Which variables to measure to reduce risk of injury?

Session Rate of Percived exertion (sRPE) (Internal load)

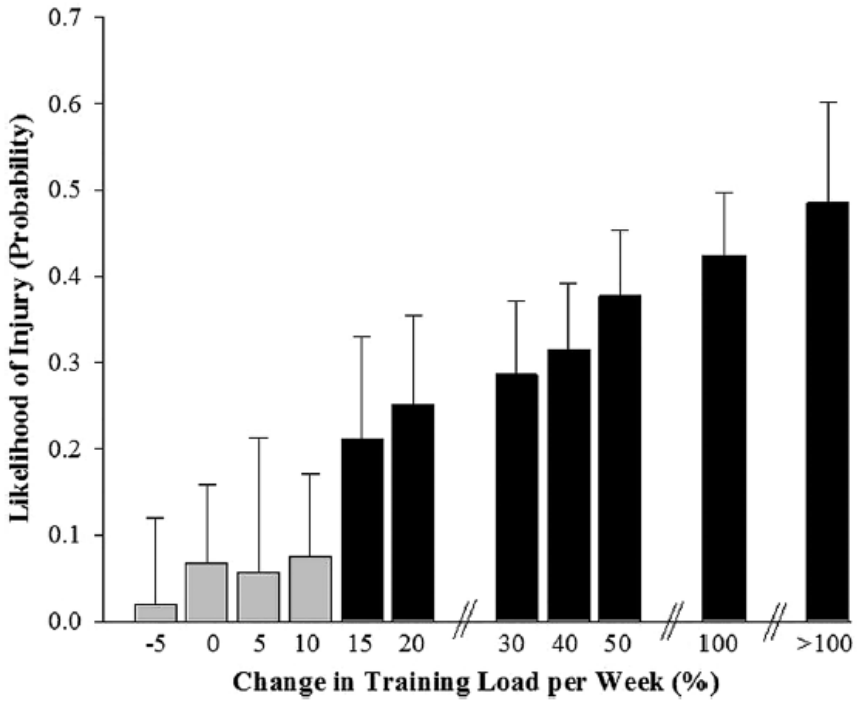
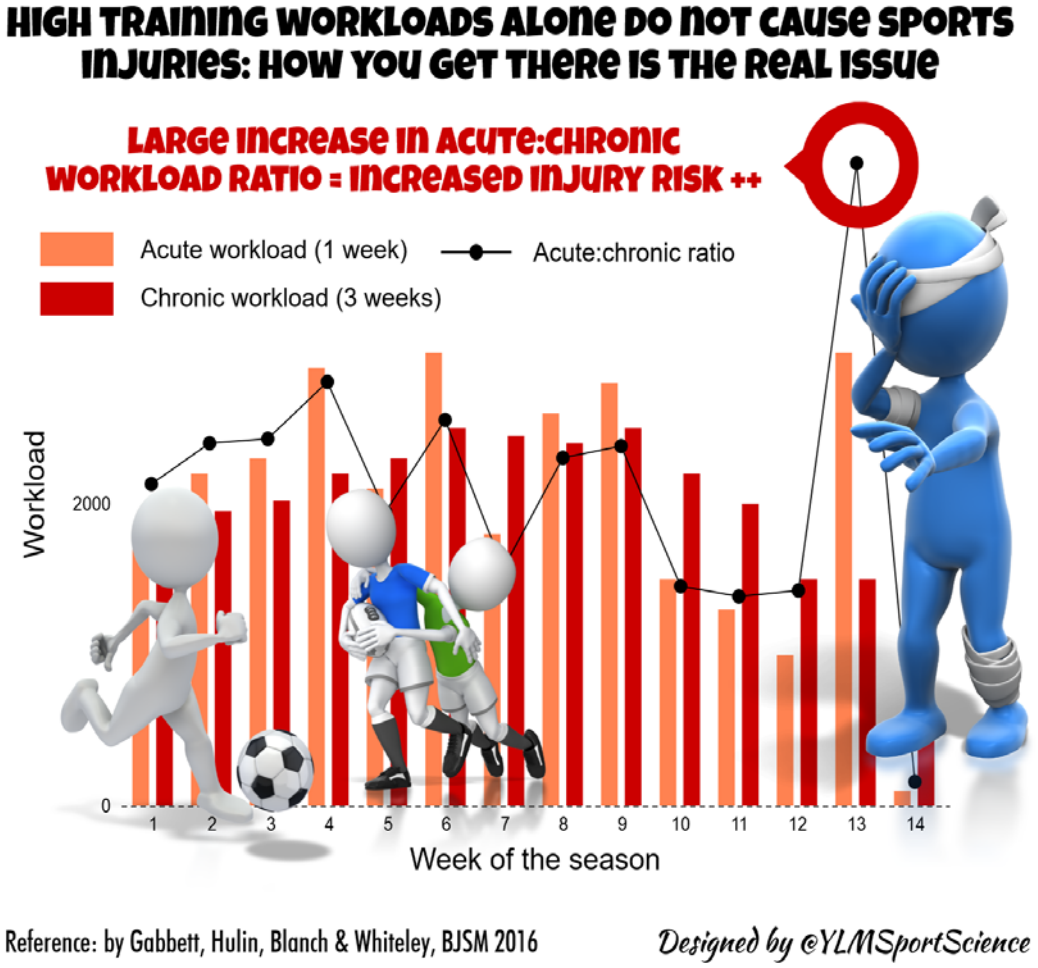


Figure 5 Likelihood of injury with different changes in training load.

GPS/Accelerometer (external load)



Which variables to measure for Performance?

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ORIGINAL ARTICLE

Muscle variables of importance for physiological performance in competitive football

Magni Mohr[1,2] · Martin Thomassen[3] · Olivier Girard[4,5] · Sebastien Racinais[4] · Lars Nybo[3]

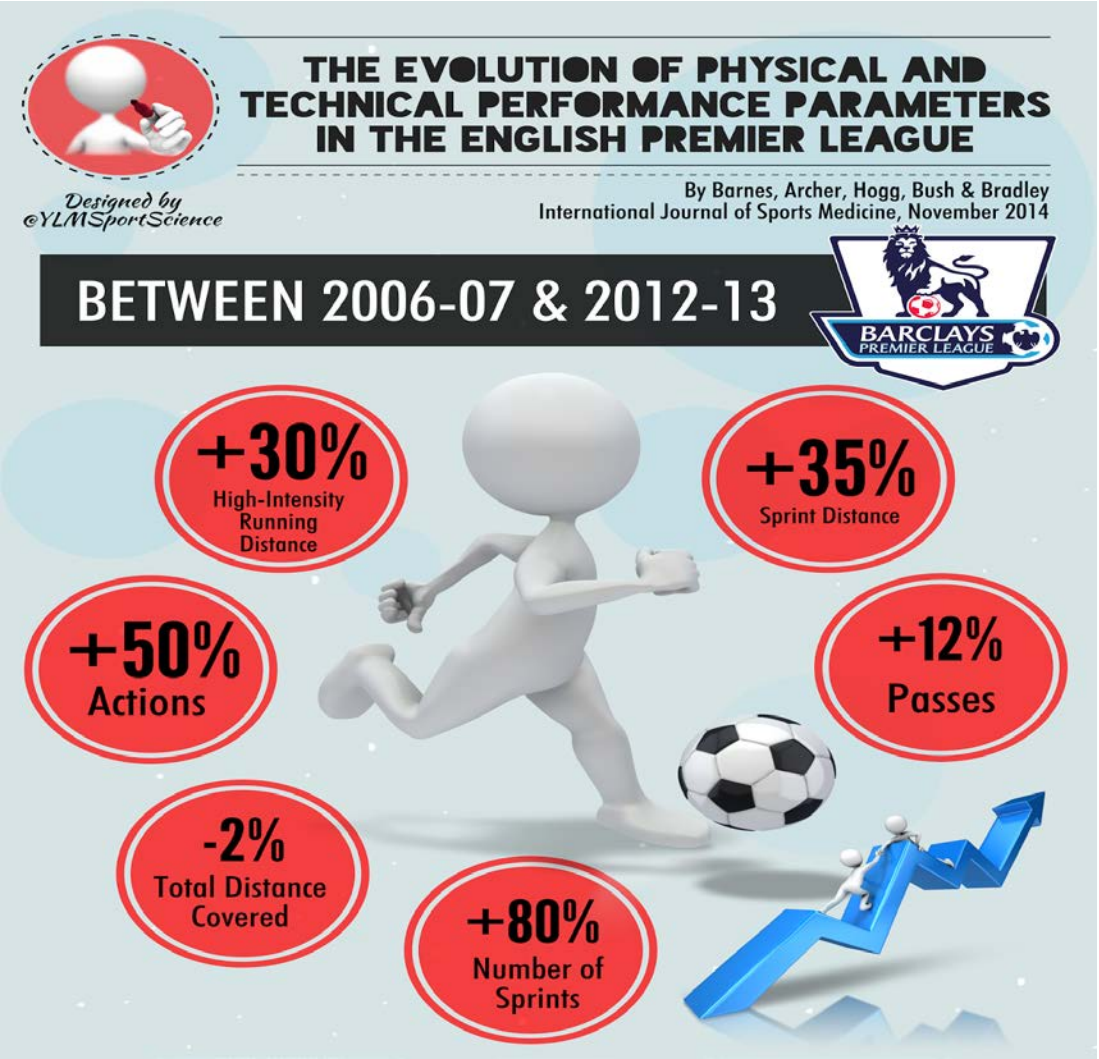
Aerobic performance

Total distance covered and HAD activity	$r = 0.66$; $P < 0.05$
Total distance covered and Yo-Yo IR1	$r = 0.76$; $P < 0.05$

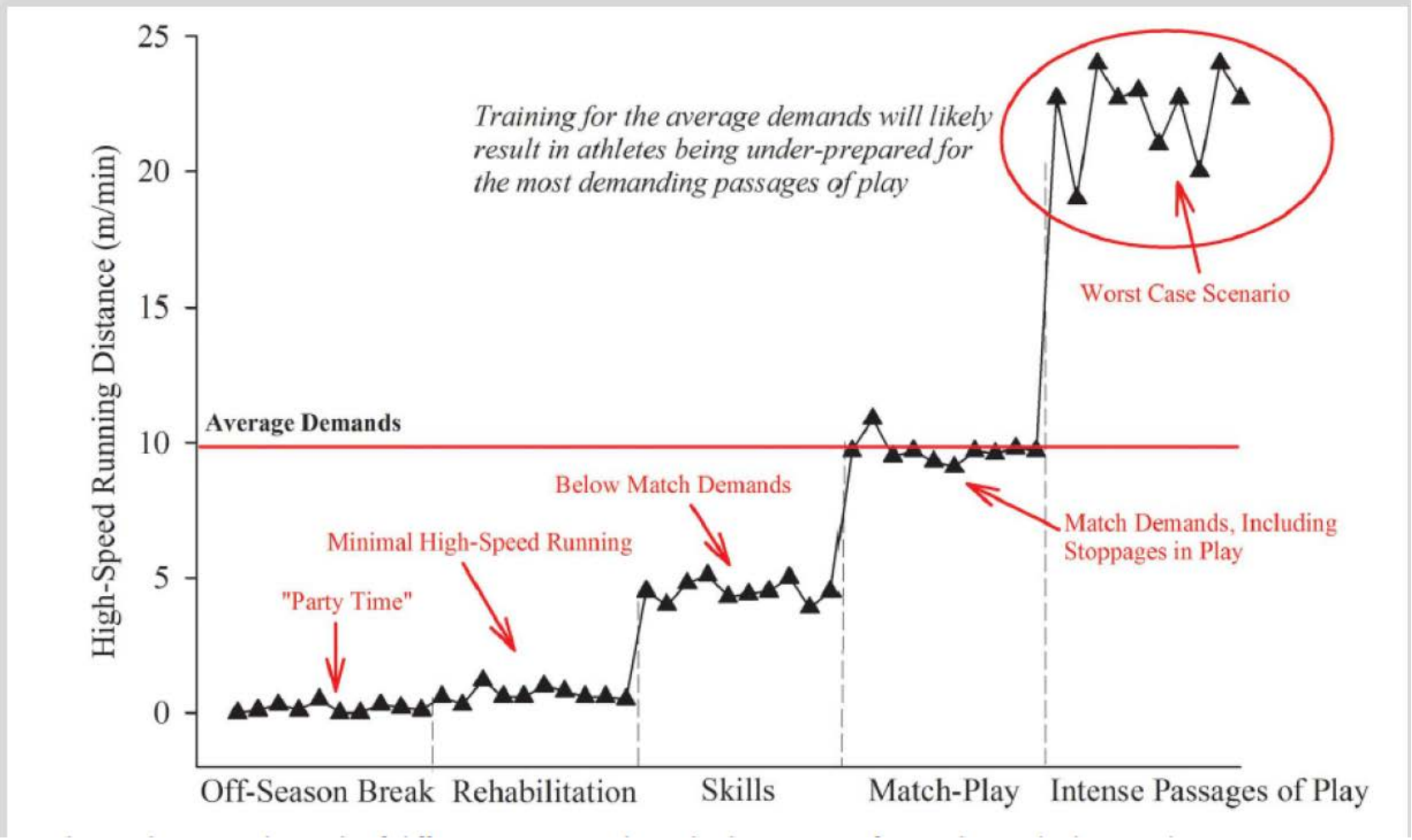
High intensity performance

Peak 5-min distance at fast running and Na^+–K^+-ATPase β_1 protein	$r = 0.59$; $P < 0.05$
Yo-Yo IR2 performance and very peak 5-min distance at very fast running	$r = 0.56$; $P < 0.05$

Volume of intensity has increased



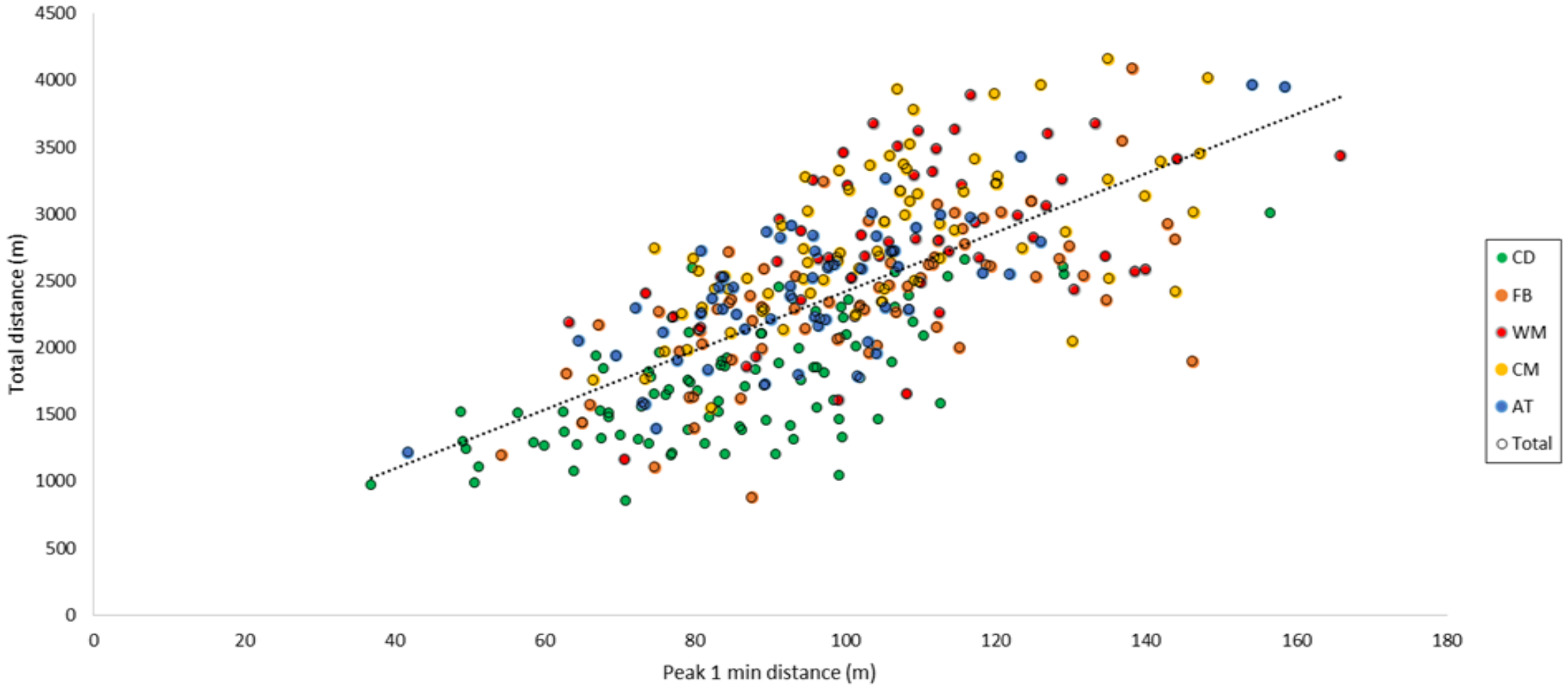
Intense periods during a football game



Gabett et al 2016

Large individual differences in game demands

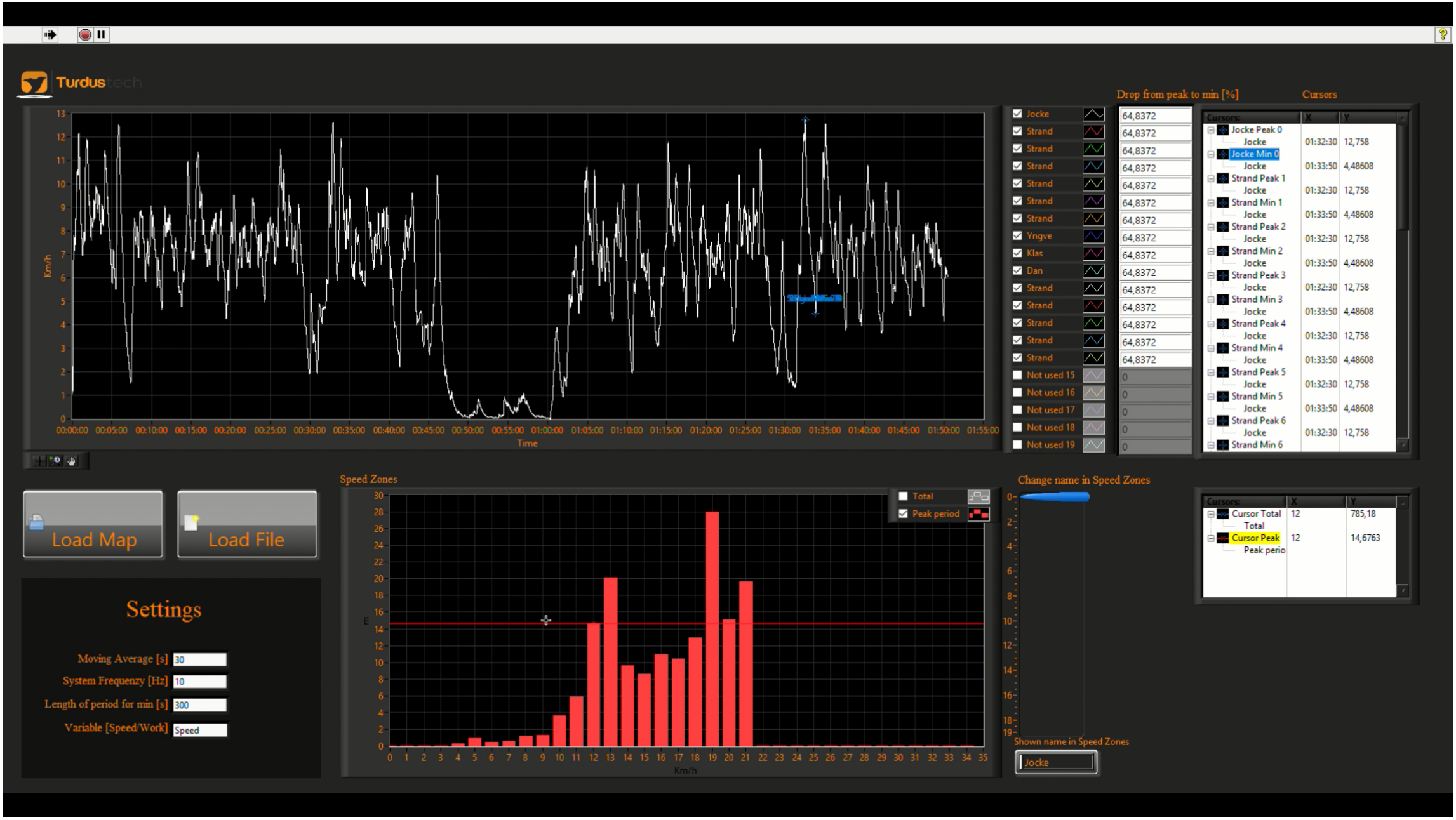
Distance covered >14 km/h



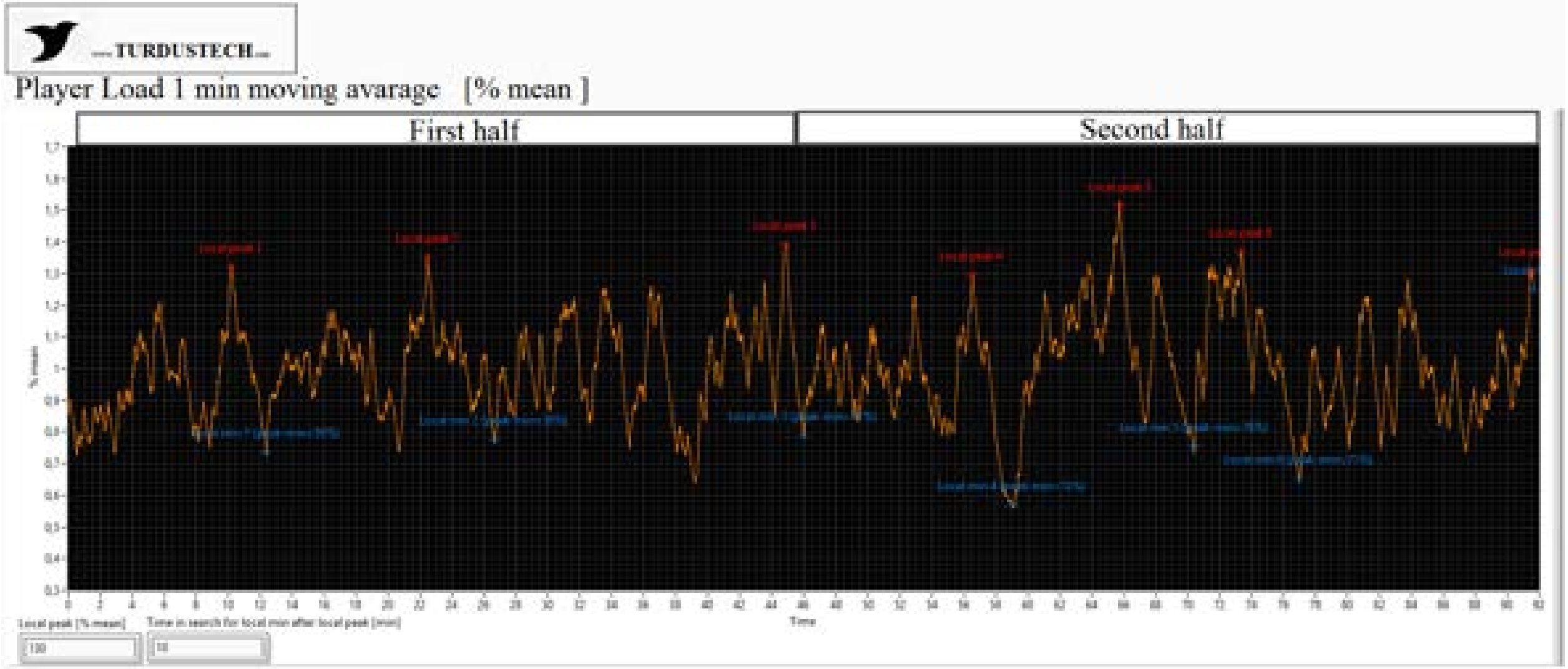
Fransson et al 2017

Peak 30 s period Wide midfielder

Velocity based peak period



Acceleration based peak periods



Variables of importance to evaluate physical workload

A:C ratio and weekly increase (risk of injury)

All players 2,5 X game demands (performance)

External load:

Volume metrics:

Player load	Sum of all acceleration and deceleration in 3D
Hi speed running	Distance > 21 km/h
Total distance	Distance > 0 km/h
Total number explosive movements	Number of acc/dec/CoD > 3 m/s²
Sprint distance	Distance > 80% of maximum velocity

Intensity metrics

Player load/min
High speed distance/min
Total distance/min
Explosive movements/min
Peak intense periods (30s and 1 min)

Internal load:

sRPE * Training duration (min)
Time > 85% HRmax

Thank you!