A comparison of natural and artificial turf. Relation between standards and opinions

SOCRATURF Project
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Shock absorption

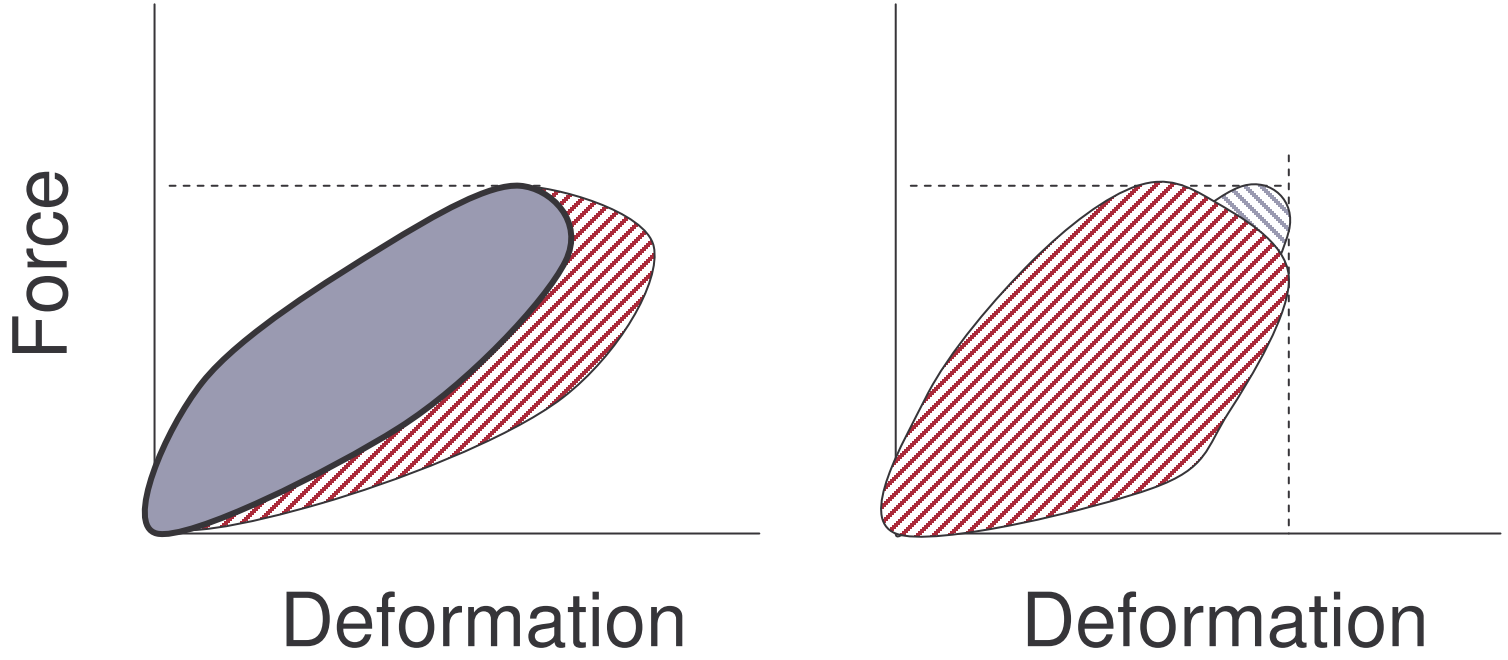
The shock absorption concept.

What measures shock absorption?

- Force?
- Deformation?
- Energy?

- In general: High force reduction, high deformation and low energy restitution.

Shock absorption



Force, deformation and energy are not 100% correlated.

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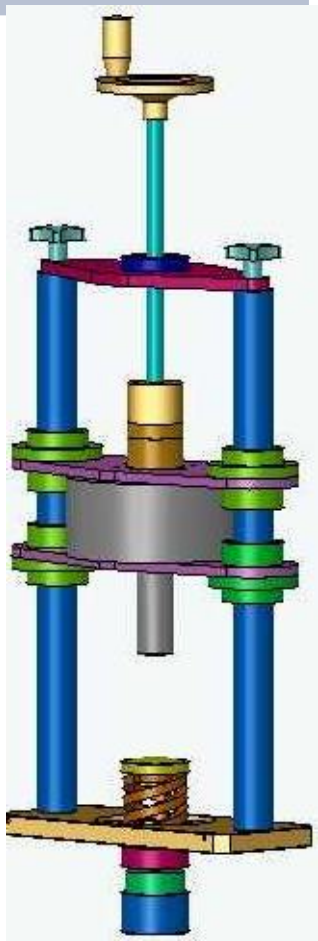
Artificial athlete

20Kg weight and 2 standard configurations:

- Force reduction: 2000KN/m spring / 55mm falling height.
  HIGH IMPACT

- Deformation: 40KN/m / 120mm falling height.
  LOW IMPACT



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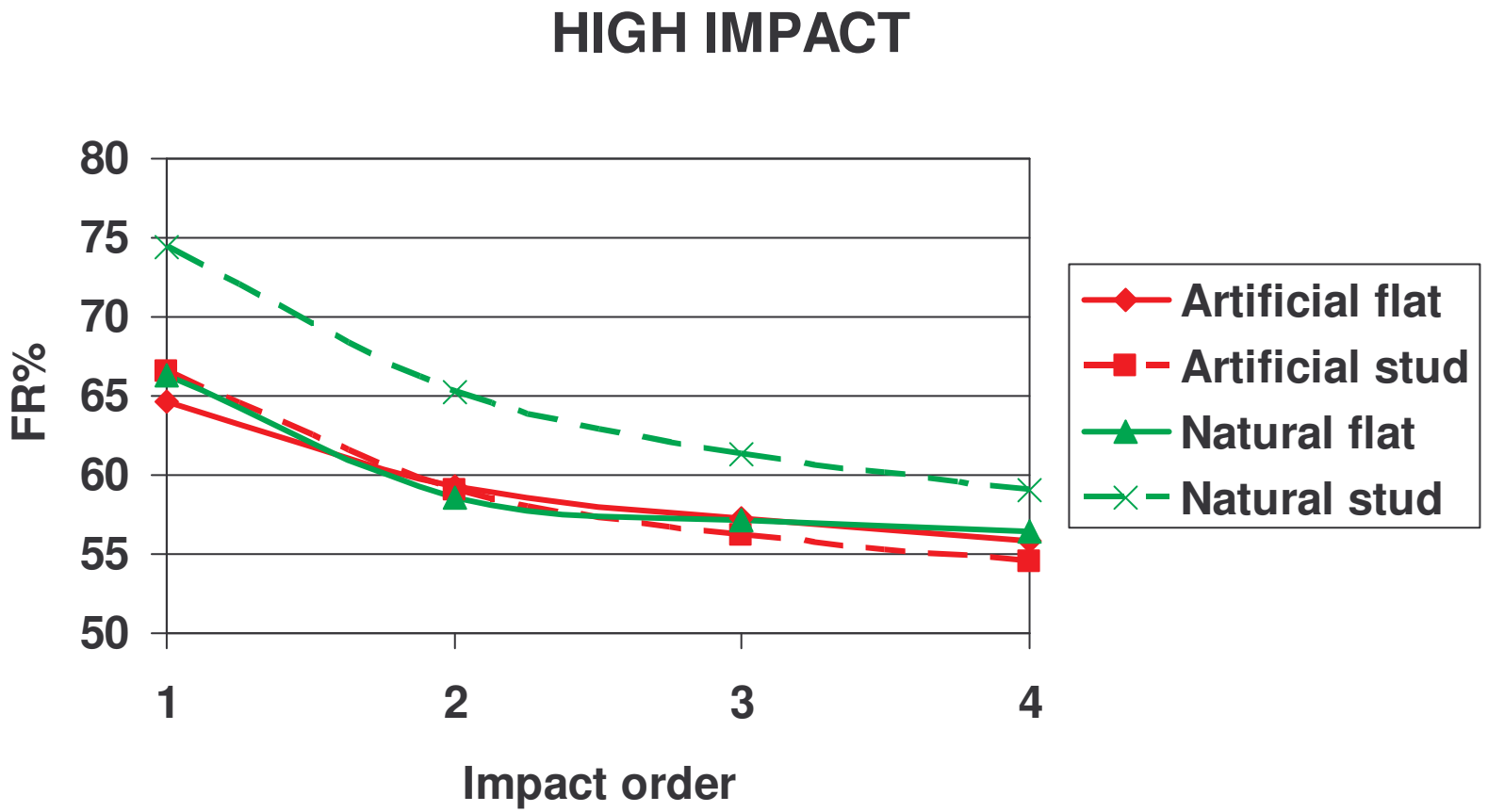
FR vs. Impact Order



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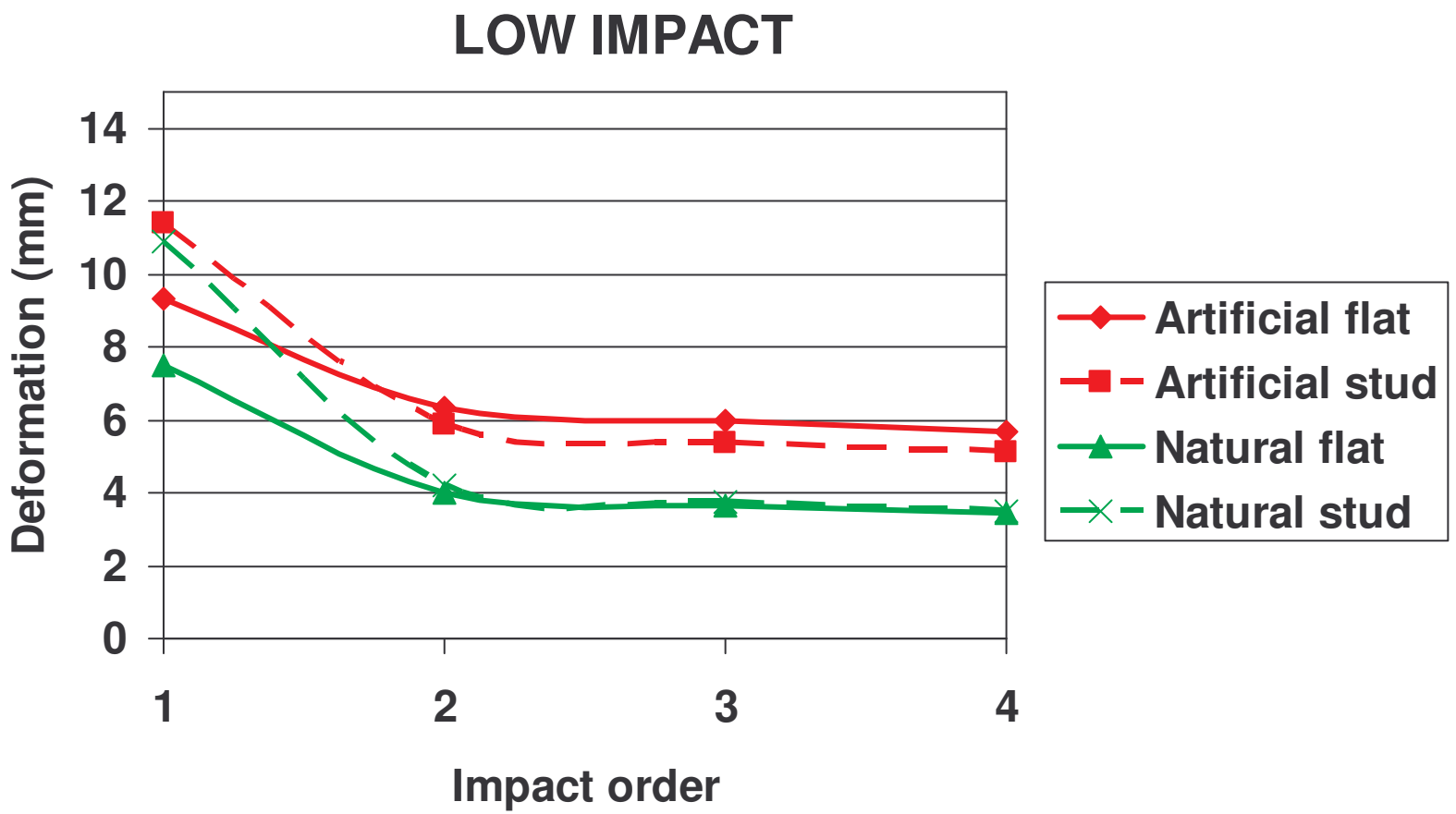
Deformation vs. Impact Order



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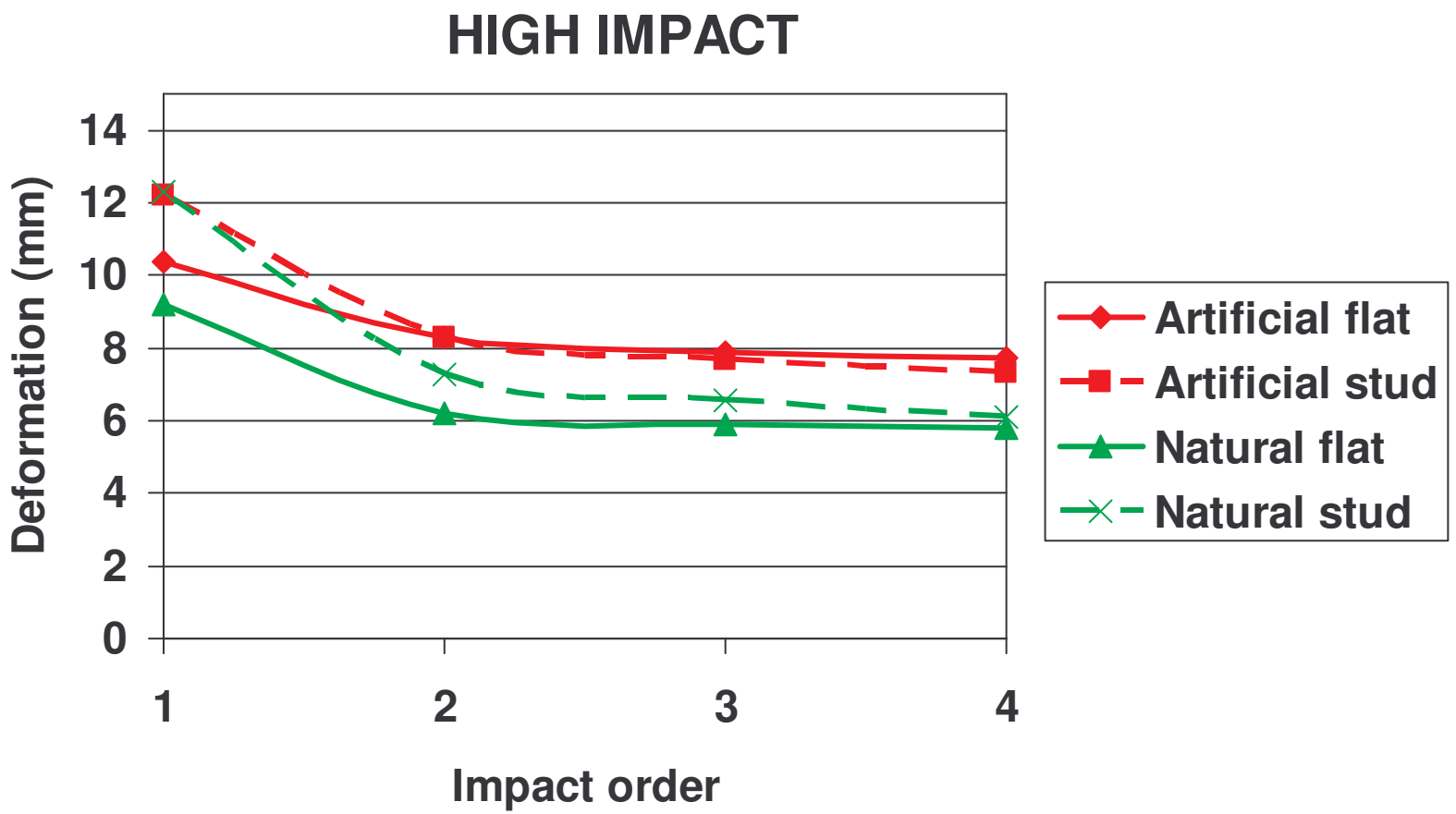
Deformation vs. Impact Order



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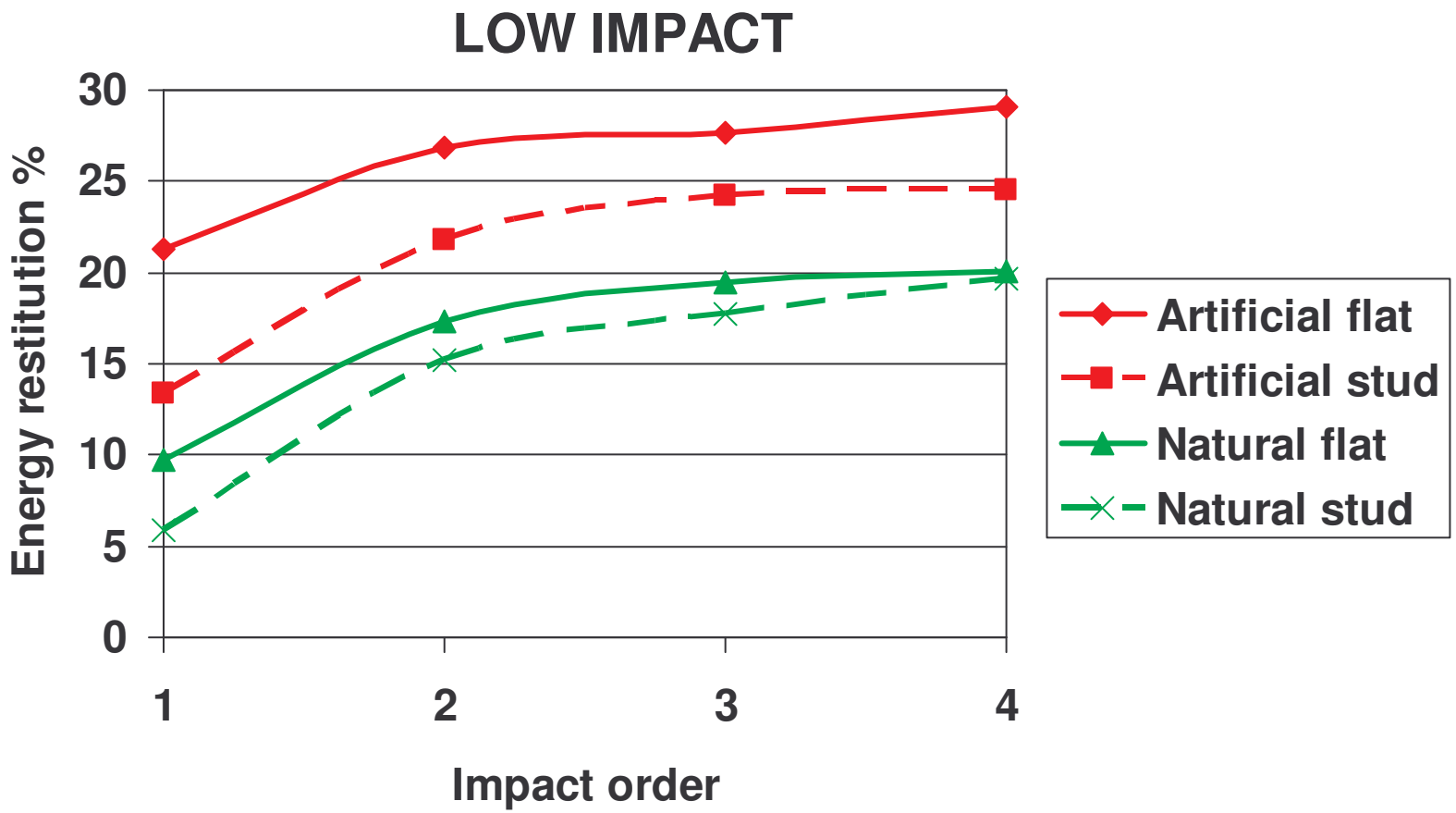
Energy vs. Impact Order



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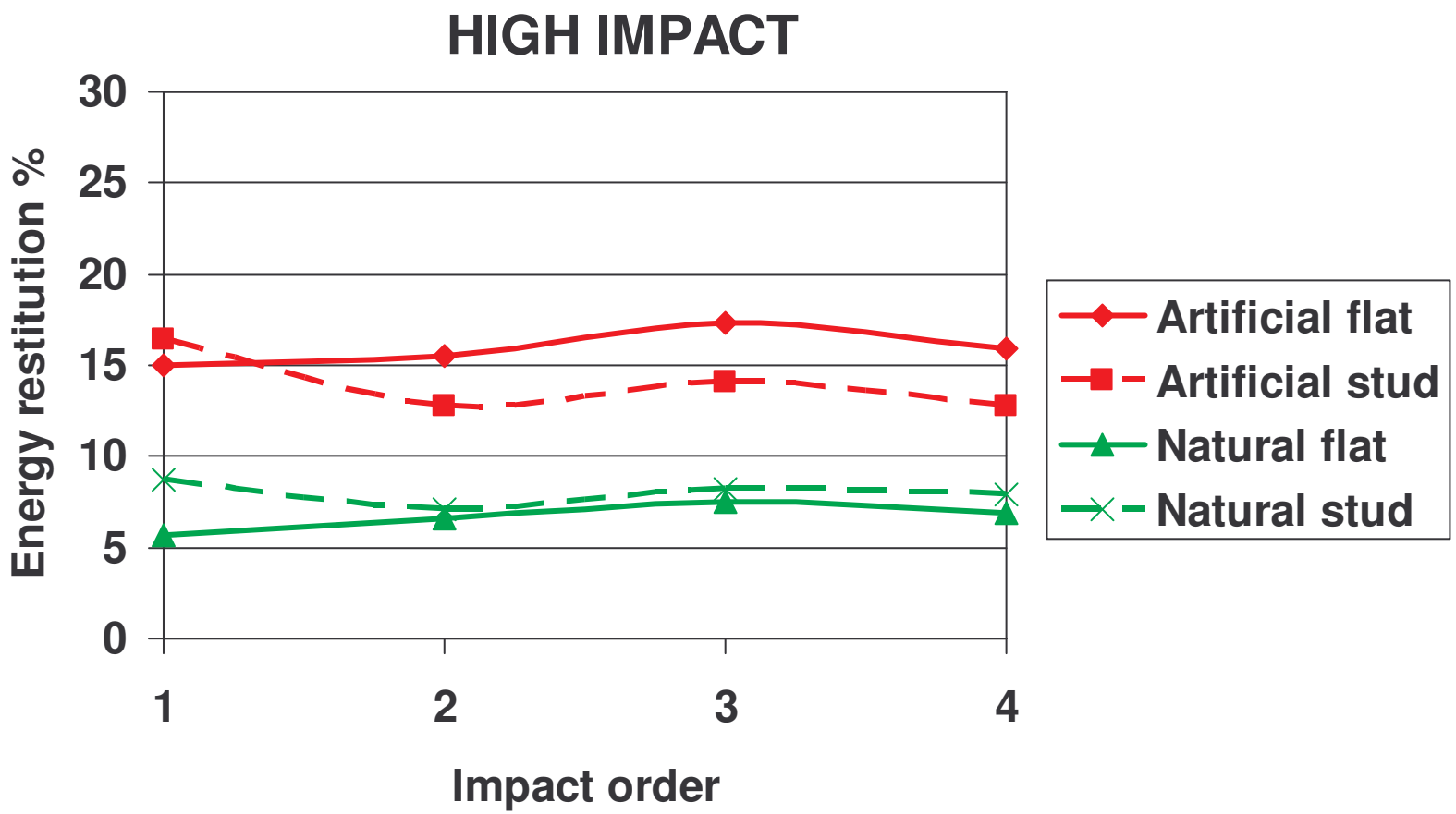
Energy vs. Impact Order



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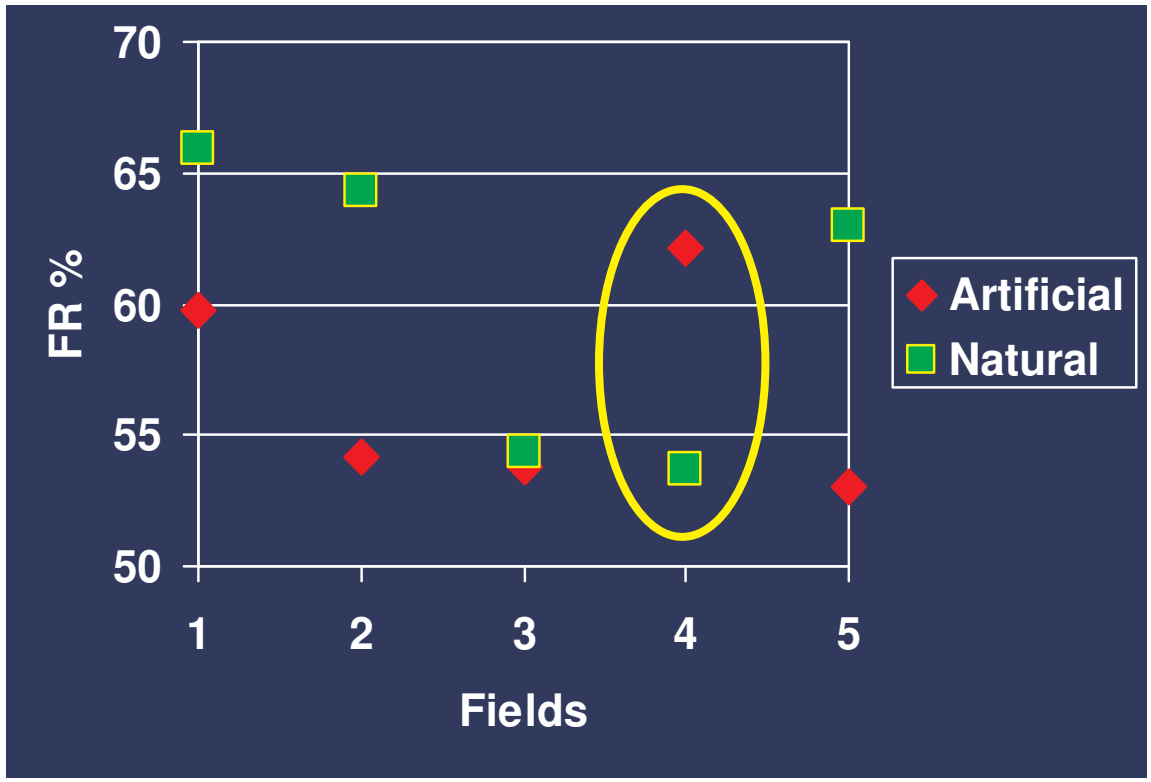
Relation with opinion



In all cases players consider natural turf more shock absorbent, except for the fields' number 4.

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Shock absorption

Artificial athlete is useful for testing shock absorption and deformation, but is necessary to introduce changes in order to:

- Testing energy and rigidity dynamic behavior.
- To know how properties changes with each impact.
- To use studded foot.

Other properties

- Traction
- Ball vertical bounce
- Ball roll

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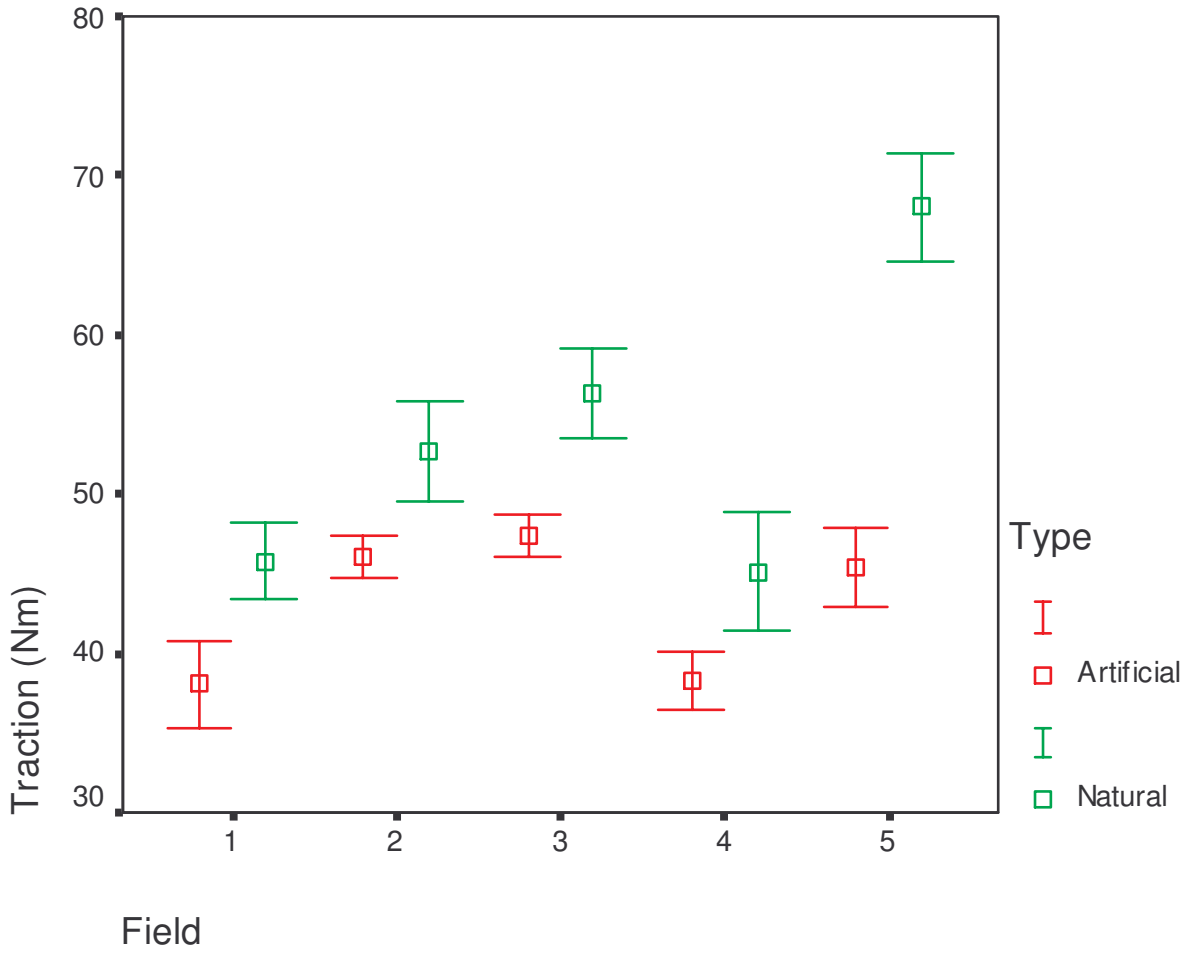
Traction



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Traction

The present standard tests have poor correlation with players' opinion or necessities. Test is useful in order to know if it is possible to play with studs.

- Define player's movement parameters.
- Design a test device according to the player's movement parameters.

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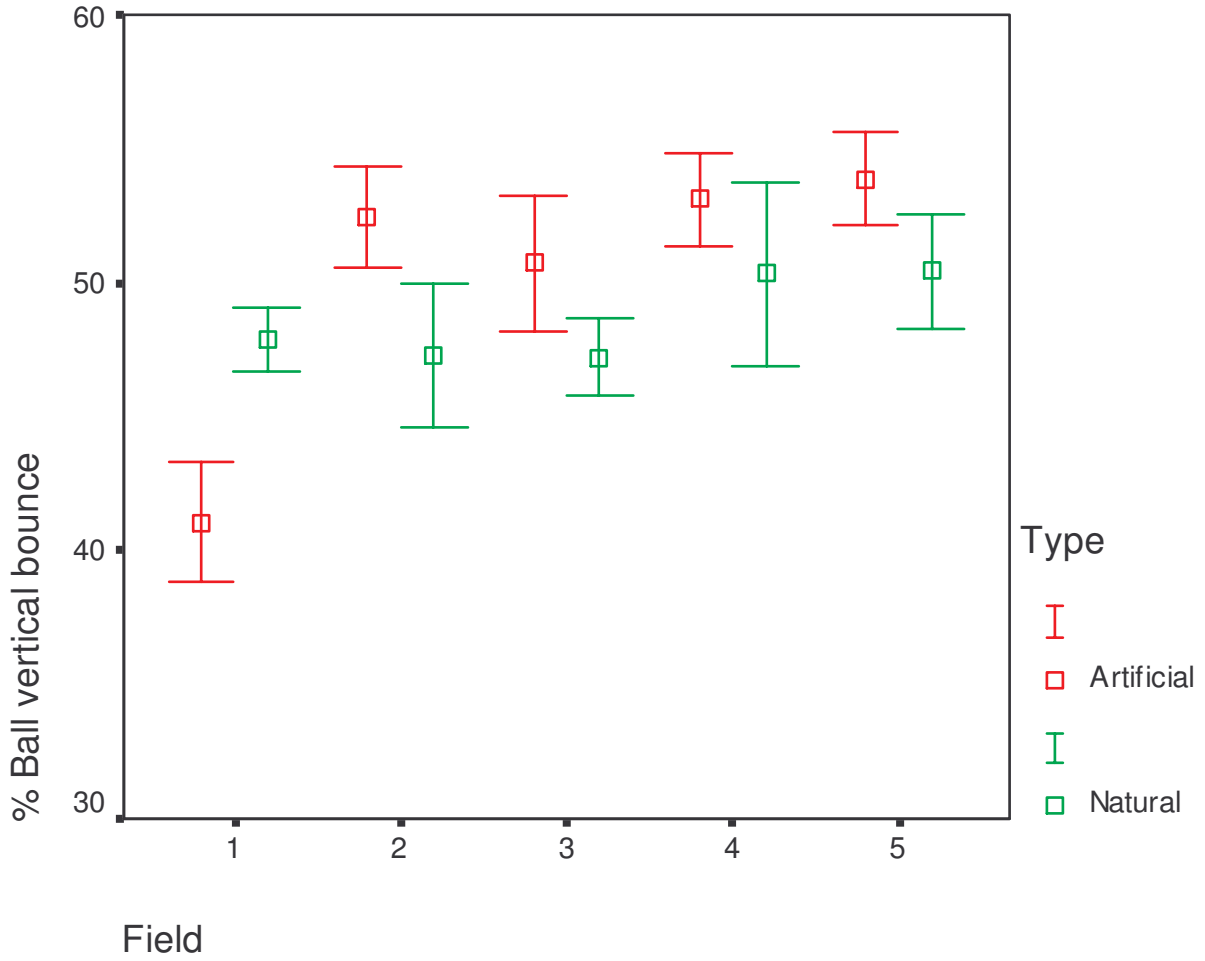
Ball vertical bounce



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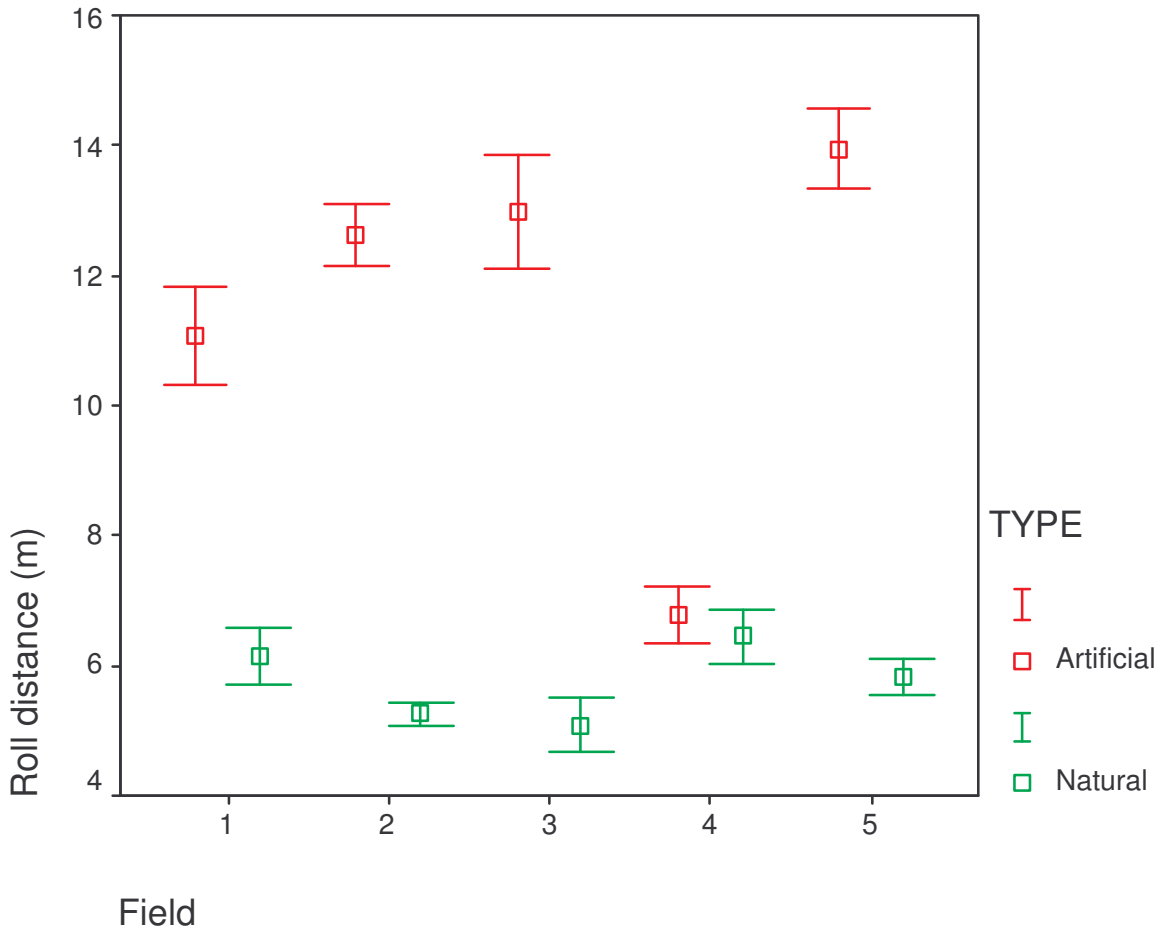
Ball vertical bounce

Player's opinion agree with test results, but limits could be reconsidered.

Ball roll



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Ball roll

The results of the five sites tested show that there is no clear relationship between the ball rolling distance and the absolute opinion of the players.

It seems that players the players judge the ball rolling on the combination of how the ball rolls and how fast it rolls.

SOCRATURF Project

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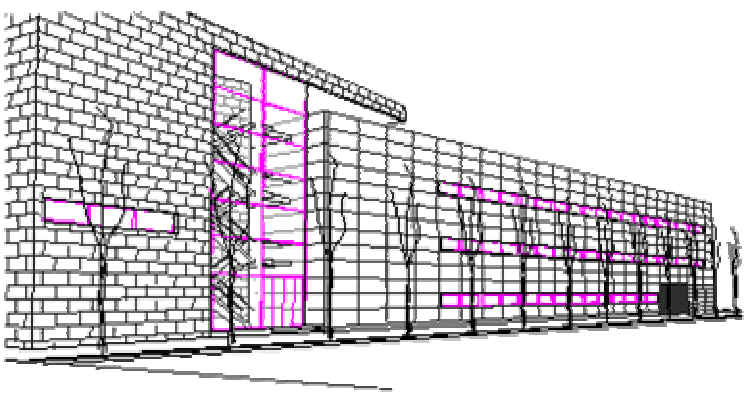

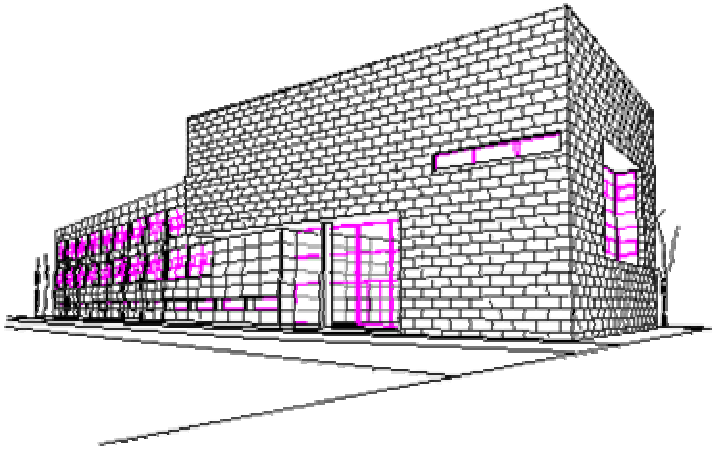

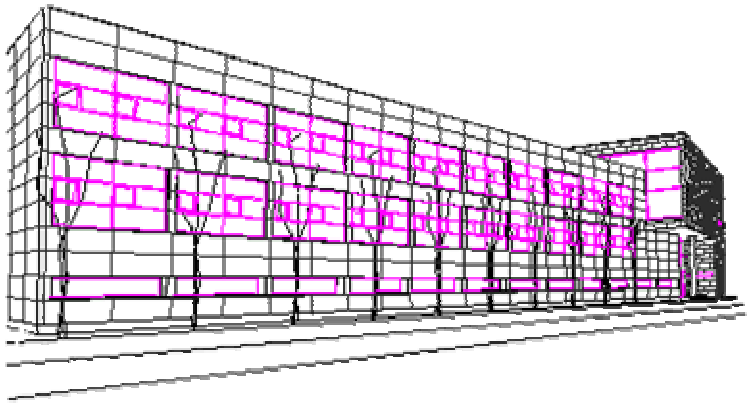

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