THE FULLY INSTRUMENTED CLIMBING WALL: PERFORMANCE ANALYSIS, ROUTE GRADING AND VECTOR DIAGRAMS – A PRELIMINARY STUDY

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The aim of this study was to develop a fully instrumented climbing wall, design bouldering route, and suggest a preliminary procedure for performance analysis and route grading.
Experiment

Wall
• Eight holds, with 6 DOF silicon strain-gauged transducers

• Two climbs (each 1.5 boulder circle)

Parameters
• Mean force
• Maximal Force
• Impulse
• Hausdorff dimension (smoothness factor)
No significant difference between the 5 climbers in force, contact time and impulse parameters.
Results

Figure 3. Vector diagrams of 3 climbers and in superposition with the wall (front view).
The eight hold wall develop for project was sufficient enough for a circular boulder.

The Hausdorff dimensions is suitable replacement for the smoothness factor previously applied (Fuss et al. 2003ab, 2004; Fuss Niegl, 2006a).