

# 足底圧分布検出によるスキージャンプ競技力向上のための 指導法の開発

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## **Detection of Foot Pressure Distribution for the Coaching in Ski - Jumping**

by

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## ABSTRACT

A system to measure a foot pressure distribution was constructed and applied to the field of competitive sport, i. e. ski jumping on normal hill.

The system consists of three parts, i. e., a pressure detection, a transmitter and a receiver for telemetry. A section for the pressure detection was made from pressure sensors, 6 and 2mm in their diameter and thickness respectively and the detector side of them was covered with thin square metal. The sensors were attached on the front and rear parts of the sole of both feet ( planta pedis ). The signals were led to wireless installation section on the waist of a subject and transmitted by radio wave ( 260MHz ) to the last section composed of receiver and recorder equipments. After the confirmation of those function by the testing with walking and vertical jumping, foot pressure distribution in the real on-snow ski jumping was investigated and analyzed. The pressure signals from four sensors were all well recorded, and the change of its distribution related to a down hill decent and jumping could be evaluated. Unexpected high pressure was noticed after the thrust of taking off from a hill.

## 要 旨

スキージャンプにおける足底圧分布を計測するために圧センサー（6mm径，2mm厚）を利用して検出装置を作製した。そして左右の足底の各踵部および前部に検出装置を装着し，検出信号を腰部分まで導出し，送信装置から記録部まで無線搬送するシステムを構成した。そしてまず，この計測システムにおける静特性および動特性試験を経て歩行と垂直跳動作による足底圧検出試験を実施し，従来報告された結果と比較検討した。続いて一流選手を対象に北海道名寄市に設置されるノーマル級公認ヒルで雪上実ジャンプを実施した時の足底圧分布を計測した。信号の無線搬送能に依存しつつ助走滑走の終盤からフライト移行の直後まで記録が得られた。両足底4点からの各記録はスキー板から伝わる相当度の振動を含みながら滑走条件の変化に伴う圧力変化を示した。本研究ではフライト移行の直後にも相対的に強度の足底圧が記録され注目された。