

## Contact pressure allocation under bogie axles and tracked vehicles

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### **Abstract:**

*At present forestry in Europe copes with an increasing demand for raw timber, both for material and for energetic use. In addition public is getting more sensitized for the impact of forest operations. Therefore conflicts arise with the requirements of a continuous supply of industry with timber, because forest operations sometimes have to be carried out at inappropriate weather and therefore soil conditions.*

*The visible result is often soil compaction to the point of total loss of traffic ability. Soil compaction is seen as a outcome from high wheel loads at wet soil conditions. The pressure limits that can be applied to the soil without serious harm are widely discussed but often lack the real input pressure. A lot of formula is known to calculate the contact pressure but the knowledge for the allocation of pressure is lacking. Calculations of contact pressure from the contact patch area and the wheel load result in notably low values. Measurements with an sufficient spatial resolution are complex and not widely used.*

*On the basis of an existing single wheel tester for pressure allocation measurements under tires an advanced measurement system is developed. Aim of the new system is to measure pressure allocation with a resolution below 1 cm<sup>2</sup> for forest machines with bogie axles as well as for tracked vehicles. In additions to this static measurements the (dynamic) stresses while rolling over the soil with the machines will be measurable.*

*The resulting mean and maximum pressures as well as the allocation of pressure can help to refine machine soil interaction models. On the other hand the already discussed possibilities to reduce the impact of forest machinery (to the soils) could be evaluated by these measurements. The question which real benefit results from bogie tracks and tracked machinery will be answerable.*

**Keywords:** soil compaction, traffic ability, forest machines

**Remark:** Full paper has not been submitted.