

## Measurement Trailer for the Analysis of Tire-Friction Behavior

Relevance to the Automotive Industry:	The dynamic of a vehicle in longitudinal, lateral und vertical direction is highly influenced by the tire properties. For the understanding of tire behavior and for further improvements, the physical effects of the tire behavior have to be investigated. The knowledge of these properties is necessary for simulating vehicle dynamics and the interpretation of vehicle dynamic measurements.	
Research Location:	TUD Fahrzeugtechnik (FZD)	VT
Homepage (Engl.):	<a href="http://www.tu-darmstadt.de/fzd/index_en.html">http://www.tu-darmstadt.de/fzd/index_en.html</a>	
Faculty Mentor:	Prof. Dr. rer. nat. Hermann Winner	
Faculty Mentor Email:	winner@fzd.tu-darmstadt.de	
Graduate Mentor:	Dipl.-Ing. Marcus A. Reul	
Graduate Mentor Email:	reul@fzd.tu-darmstadt.de	
Project Description:	<p>For the research of tire-friction behavior under real driving conditions, a measurement trailer was developed at the Chair of Automotive Engineering (FZD) at the Technische Universität Darmstadt. With this trailer, the friction behavior between different tires and road surfaces can be examined in driving tests under variable conditions of longitudinal slip, sliding speed, slip angle, camber, and wheel load. Compared to other methods, the construction of the applied breaking torque allows for breaking the wheel in a range above the friction maximum without locking the wheel. So, this feature allows the measurement of the complete <math>\mu</math>-slip characteristics.</p> <p>Tasks available include design and calibration or experimental work with the trailer on a closed test track.</p>	
Jun 9 - Aug 1, 2008; (8 weeks, 40h/week)		
Necessary Skills/ Knowledge:	<ul style="list-style-type: none"> <li>• Ability to work methodically and independently</li> <li>• Driver's license for passenger cars (valid for EU)</li> <li>• MATLAB</li> </ul>	
Desirable Skills/ Knowledge:	<ul style="list-style-type: none"> <li>• LabView 8</li> <li>• Experiences in measurement analysis, including data filtering</li> </ul>	
Additional Online Resource(s):	<a href="http://www.tu-darmstadt.de/fzd/english/equipment.html">http://www.tu-darmstadt.de/fzd/english/equipment.html</a>	

NSF REU Students must have completed at least two semesters of engineering studies prior to the proposed summer research, and they must have at least one semester remaining before they can earn their BS in Engineering.