20th March 2014

**YOKOHAMA and JAXA Joint R&D Effort Succeeds in World’s First Simulation of Acoustics around a Rolling Tyre**

Tokyo – The Yokohama Rubber Co., Ltd., announced today that company researchers working together with a team of researchers led by Professor Kozo Fujii at the Institute of Space and Astronautical Science (ISAS), Japan Aerospace Exploration Agency (JAXA) have succeeded in the world’s first simulation of near real-scale flow structures (turbulence) around a tyre rolling on a road surface and the acoustic waves (noise) generated from these structures. The realization of a simulation of a flow structure enabling precise measurement of acoustic waves opens up potential for new technological breakthroughs that could lead to the reduction of pass-by noise and improvement of aerodynamic performance. YOKOHAMA therefore will continue to support further research in these areas.

Conventional computational methods have limited accuracy in the vicinity of the tyre’s contact point with the road surface. The joint research team succeeded in increasing the accuracy of such computations by using both a supercomputer and a high-resolution computational method developed by researchers at ISAS/JAXA for use in space exploration research. By directly simulating a detailed tyre model, the joint research team attained the computations of both of the air-flow field around a rolling tyre at close to actual scale and its acoustic field. As a result, the researchers were able to demonstrate for the first time that the source of noise from tyres is not only caused by the turbulence structure around a rolling tyre but also from the compressed flow structures in front of a rolling tyre caused by the air circulating around it.

In recent years, YOKOHAMA has been active in the development of next-generation environmental technologies through the use of various simulations. In 2010, YOKOHAMA established an aerodynamic simulation technique that enables simulation of air flow around tyres under actual use conditions. Using this technique, in December 2012, YOKOHAMA developed its fin tyre design, which reduces aerodynamic drag on a vehicle by controlling the air flow in the wheel well. These fin tyres have been featured at Company displays at major motor shows around the world.



***Vertical flow structure of air flow around a rolling tyre and acoustic waves caused by that flow***