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Preface

In 1985, the Flight Mechanics Panel of AGARD published AGARDograph 285, "Simulation of Aircraft Behaviour on and close to the Ground". The report discusses the benefits derived from using ground-based simulation to represent aircraft on the ground. It presents the then-current standards of modeling and visual/motion hardware technology, and gives examples of experience from specific simulators devoted to research, development, and pilot training.

Since that time, several factors have appeared, to allow higher standards of ground roll simulation to be achieved.

- models of the relevant elements – runway surface, tires, brakes, landing gear, aerodynamics – can be made more accurate, because of increased computer speed and capacity;
- more experimental data is available, relating to runway surface conditions, and surface contamination (rain, snow, ice);
- the technology to provide visual and motion cues to the pilot has improved;
- the need for ground-based simulation of aircraft (and other vehicles) has increased. New ideas, such as active suspension, can be addressed.

The Flight Mechanics Panel invited the authors of AGARDograph 285 to produce a second report on the subject, incorporating the new knowledge, and presenting techniques to enable simulators to improve their representation of aircraft on the ground. In particular, the report deals with dynamic response of an aircraft on the ground, the parameters which influence runway friction forces, and real-time modeling of tire side forces. Bandwidth is identified as the most critical factor in constructing a real-time simulation model. Areas where current simulators could be improved are identified, and topics for research are suggested.