

Principal Researcher	Satoru Komori			Number of Researchers	5	
Research Institution · Department · Title	Professor, Mechanical Engineering, Kyoto university			Location of Institution	Kyoto	
Title of Project	Scalar Transfer Mechanisms at the Sheared Air-Water Interface: Estimation of Scalar Transfer Rate					
Abstract of Research Project	<p>It is of great importance to investigate the heat and mass (scalar) transfer mechanism across the air-sea interface in order to improve the reliability of predictions for global warming. However, previous sub-models used in a general circulation model for predicting heat and mass transfer velocities across the air-sea interface have been based on the simple assumption that the transfer velocities are proportional to wind velocity over the ocean surface. This rough assumption reduces the reliability of the sub-models. The aim of this study is, therefore, to clarify the heat and mass transfer mechanism across the sheared wavy air-water interface from the fluid-mechanical point of view and to develop reliable models for the heat and mass transfer velocities that truly reflect the physical processes involved. Laboratory experiments in a wind-wave tank will enable the investigation of the effects of ocean surface physical processes on the heat and mass transfer between the atmosphere and the ocean, including phenomena such as wave breaking, swells, density stratifications, surface contamination and rain. The resulting improved models for the scalar exchange rate between the atmosphere and the ocean will lead to improved performance by the general circulation model.</p>					
References	<p>1. S. Komori and R. Misumi, The effects of bubbles on mass transfer across breaking air-water interface, <i>Gas Transfer at Water Surface</i>, AGU monograph 127, pp.285-290 (2001).</p> <p>2. S. Komori, T. Shimada and R. Misumi, Turbulence structure and mass transfer at a wind-driven air-water interface, <i>Wind-over-Wave Couplings: Perspectives and Prospects</i>, Oxford Univ. Press, pp.273-285 (1999).</p>					
Term of Project	Fiscal years 2002-2006. (5years)					
Budget Allocation (in thousand of yen)	FY2002	FY2003	FY2004	FY2005	FY2006	TOTAL
	16,300	18,600	23,600	10,000	9,400	77,900
Homepage Address	http://mech-server.mech.kyoto-u.ac.jp/lab/komori/					