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Boundary layers at a dynamic interface: air-sea exchange of heat and mass ANDREW SZERI, Univ of British Columbia — Exchange of mass or heat across a turbulent liquid-gas interface is a problem of critical interest, especially in air-sea transfer of natural and man-made gases involved in climate change. The goal in this research area is to determine the gas flux from air to sea or vice versa. For sparingly soluble non-reactive gases, this is controlled by liquid phase turbulent velocity fluctuations that act on the thin species concentration boundary layer on the liquid side of the interface. If the fluctuations in surface-normal velocity and gas concentration differences are known, then it is possible to determine the turbulent contribution to the gas flux. However, there is no suitable fundamental direct approach in the general case where neither of these quantities can be easily measured. A new approach is presented to deduce key aspects about the near-surface turbulent motions from remote measurements, which allows one to determine the gas transfer velocity, or gas flux per unit area if overall concentration differences are known. The approach is illustrated with conceptual examples.

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