

Abstract Submitted
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Global Warming and the Microwave Background. PIERRE-MARIE ROBITAILLE, The Ohio State University — The energy balance of our planet is determined by the relationship between absorbed (solar) and emitted (earthly) radiation. In many models, the Earth's radiation is derived by applying Stefan's Law, at a given effective temperature, thereby treating the globe as a uniform blackbody source. However, the oceans cannot be treated as simple blackbody emitters. In fact, while water can provide strong emission bands in the IR, the spectrum is far from blackbody. This is particularly important in the microwave region where the oceans mimic a 3K blackbody source (the Penzias and Wilson signal). As a result, the oceans are poor emitters of radiation in this spectral range. Their inability to efficiently emit radiation results in substantial retention of thermal energy within oceanic systems. Unable to dissipate heat through emission, the oceans turn to convection currents. This provides a driving force for oceanic currents and for hurricanes. It is in the interest of the United States to properly ascertain the Earth's emission profile by using an array of satellites which continually monitor spectral emissions from the microwave through the IR. These satellites will reveal that the Penzias and Wilson signal does originate from the oceans. It is only when the complete emission profile of the Earth is properly understood that mankind will begin to make real progress in modeling global warming.

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