

Looking at the Entire Sunlit Earth from the L1 Point; The very first results

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The NOAA Deep Space Climate Observatory (DSCOVR) spacecraft was launched in February 2015 and in June 2015 achieved its orbit at the first Lagrange point or L1, 1.5 million km from Earth towards the Sun. There are two NASA Earth observing instruments onboard: the National Institute of Standards and Technology Advanced Radiometer (NISTAR) and the Earth Polychromatic Imaging Camera (EPIC). NISTAR is a set of 3 high-precision cavity radiometers and one diode detector designed to detect the total emitted and reflected energy from the Earth (from UV to IR) in the near backscatter direction. Its goal is to study the Earth's energy balance from this unique view angle of L1 and use the data to fill in a missing portion of similar data obtained in low earth orbit. EPIC views the entire sunlit Earth from sunrise to sunset at scattering angles between 165° and 176° with 10 narrowband filters: 317, 325, 340, 388, 443, 552, 680, 688, 764 and 779 nm. The expected main EPIC products will be total ozone amount, UV and visible aerosol properties, scene reflectivity, vegetation properties, and cloud height. In our presentation, we discuss the uniqueness of L1 observations of diurnal variation of aerosols, clouds, and vegetation for the entire globe and show the first preliminary science results.