

Search For Chiral Signatures in the Earthshine

Michael F. Sterzik

Stefano Bagnulo

European Southern Observatory

Santiago/Chile

msterzik@eso.org

We search for circular polarization in the spectrum of the earthshine as induced by chiral molecules of living material on the surface of the Earth. Biotic material with its helical molecular structure is known to produce circular polarization of reflected light up to levels of a few percent, thus in the range of detectability of FORS1 mounted at the Very Large Telescope in Paranal/Chile.

Organic material on Earth is abundant, but its detectability using astronomical remote sensing techniques, e.g. through the Vegetation Red Edge, is usually difficult, and not undisputed. Our experiment is a benchmark required for future attempts to detect biotic material on other astronomical objects.

Preliminary results of the experiment show that circular polarization in the Earthshine can be detected, and correlates with the fractional vegetation cover observed.