Why Measure CMB Polarization?

In 1965, measurement of the temperature of the Cosmic Microwave Background (CMB) helped test the Big Bang Model of Cosmology. Recently, accurate measurement of CMB anisotropy has shown that the universe is experimentally flat, and has provided more evidence for inflation. In addition, it is a feature of the CMB that can yield even more cosmological information in polarization.

The CMB is theorized to be polarized at an amount less than or equal to 10% of its isotropy level. This level depends sensitively on both the recombination history of the universe, and on angular scale, as well as all the cosmological parameters. In general, we expect natural modes to characteristic CMB polarization, but not just one. In terms of power spectra, there are E, B, and TE cross-correlation power spectra. E modes result from density perturbations in the early universe, while B mode power spectra are generally caused by gravitational waves. In addition, E is expected to be correlated with temperature anisotropy at a level of 10-50%, yielding the "TE" modes. E and B are related by the linear Stokes' parameters $\text{E}$ and $\text{B}$ = $i\text{E}$ for the linear Stokes' parameters.

The POLAR (Observations of Polarization in the Quasar Angular Region) experiment measures CMB polarization at large scales, and is primarily able to constrain the epoch of CMB anisotropy have shown that we live in a geometrically flat universe, and have provided (CMB) helped verify the Big Bang Model of Cosmology. Recently, accurate measurements of CMB anisotropy have shown that we live in a geometrically flat universe, and have provided a measure of the universe's shape. In general, we need several methods to determine these parameters.

Why Measure CMB Polarization?

In 1965, measurements of the temperature of the Cosmic Microwave Background (CMB) helped test the Big Bang Model of Cosmology. Recently, accurate measurements of CMB anisotropy have shown that the universe is experimentally flat, and has provided more evidence for inflation. In addition, it is a feature of the CMB that can yield even more cosmological information in polarization.

The CMB is theorized to be polarized at an amount less than or equal to 10% of its isotropy level. This level depends sensitively on both the recombination history of the universe, and on angular scale, as well as all the cosmological parameters. In general, we expect natural modes to characterize CMB polarization, but not just one. In terms of power spectra, there are E, B, and TE cross-correlation power spectra. E modes result from density perturbations in the early universe, while B mode power spectra are generally caused by gravitational waves. In addition, E is expected to be correlated with temperature anisotropy at a level of 10-50%, yielding the "TE" modes. E and B are related by the linear Stokes' parameters $\text{E}$ and $\text{B}$ = $i\text{E}$ for the linear Stokes' parameters.

The POLAR (Observations of Polarization in the Quasar Angular Region) experiment measures CMB polarization at large scales, and is primarily able to constrain the epoch of CMB anisotropy have shown that we live in a geometrically flat universe, and have provided (CMB) helped verify the Big Bang Model of Cosmology. Recently, accurate measurements of CMB anisotropy have shown that we live in a geometrically flat universe, and have provided a measure of the universe's shape. In general, we need several methods to determine these parameters.

Why Measure CMB Polarization?

In 1965, measurements of the temperature of the Cosmic Microwave Background (CMB) helped test the Big Bang Model of Cosmology. Recently, accurate measurements of CMB anisotropy have shown that the universe is experimentally flat, and has provided more evidence for inflation. In addition, it is a feature of the CMB that can yield even more cosmological information in polarization.

The CMB is theorized to be polarized at an amount less than or equal to 10% of its isotropy level. This level depends sensitively on both the recombination history of the universe, and on angular scale, as well as all the cosmological parameters. In general, we expect natural modes to characterize CMB polarization, but not just one. In terms of power spectra, there are E, B, and TE cross-correlation power spectra. E modes result from density perturbations in the early universe, while B mode power spectra are generally caused by gravitational waves. In addition, E is expected to be correlated with temperature anisotropy at a level of 10-50%, yielding the "TE" modes. E and B are related by the linear Stokes' parameters $\text{E}$ and $\text{B}$ = $i\text{E}$ for the linear Stokes' parameters.

The POLAR (Observations of Polarization in the Quasar Angular Region) experiment measures CMB polarization at large scales, and is primarily able to constrain the epoch of CMB anisotropy have shown that we live in a geometrically flat universe, and have provided (CMB) helped verify the Big Bang Model of Cosmology. Recently, accurate measurements of CMB anisotropy have shown that we live in a geometrically flat universe, and have provided a measure of the universe's shape. In general, we need several methods to determine these parameters.