Most flows in real life have 3D motion and studying them in 1D or 2D just tell part of the story. But the limitations in technology and computing power limited our ability to study 3D properties of the flows. With the advancements in these areas in the last decade, a lot of research is focused on the development of the 3D measurement techniques, such as the 3D-3C PIV techniques and the 3D density measurement techniques. Current density measurement techniques can be divided into two main categories, qualitative and quantitative measurement techniques. Measurement techniques such as schlieren and shadowgraph are the qualitative measurement techniques. Modified schlieren measurement techniques such as the calibrated color schlieren (CCS), and background oriented schlieren (BOS) can be used to measure quantitative information. Extending the idea of using BOS as a quantitative measurement technique, in this presentation, its application with plenoptic camera for measuring the 3D density of a flowfield is presented.