Working Group 1 participated in 4 separate topics at this year's SHINE workshop focusing on campaign events jointly with WG 2 and 3, modeling magnetic fields joint with Wg 2, a solo topic on vector field and surface flow measurements, and the role of energetic particles jointly with WG 3. I will concentrate on the solo WG 1 session.

Working Group 1 chose as its solo topic to concentrate on observations of vector magnetic field and photospheric flows and what they can tell us about the conditions leading to the initiation of a CME. A plenary talk was given on this topic by Bruce Lites (HAO) who set the scene nicely by discussing the latest developments in observing the solar surface.

We dedicated two sessions to this topic with the first session introducing the participants to the general issues involved with determining the vector magnetic field (180 degree ambiguity, line-of-sight issues, etc.) and photospheric flow pattern (local correlation tracking, LCT, techniques being the main focus) and the second session focusing on the application of these measurements to the CME problem.. The discussion in the first session was set-up by invited talks from Thomas Metcalf (LMSAL)- "General Issues in vector B determination", Rich Nightingale (LMSAL) - "General Issues of photospheric flow measurements", and Jeff Kuhn (IFA) - "Direct measurements of the coronal B-field". The application session began with talks from KD Leka (Colorado Research Inc.) - "Use of vector B in CME initiation", Brian Welsch (UCB) - "Application of vector B and surface flows to CME Initiation", and Zoran Mikic (SAIC) - "Using vector B-grams in quantitative calculations".

These talks and the ensuing discussions led to a number of interesting issues being raised with potential for collaborations on bringing these tools to bear on the CME problem. Two particular issues stand out. The first is the importance of developing and using chromospheric lines to measure the vector magnetic field in a region of the Sun where the field is more likely to be truly force-free. Such measurements would provide "cleaner" boundary conditions for extrapolations into the corona, required to provide the magnetic topology in the erupting region. The second is the relationship between plasma and magnetic field flows on the solar surface. The local correlation tracking techniques are typically performed on the white light observations pertaining to the plasma emission from the photosphere while, ideally, we would like to know how the magnetic field elements move. This is crucial if we want to understand helicity injection, magnetic energization and the dynamical evolution of the magnetic topology of flaring and erupting regions. A first step in addressing this issue would be to compare plasma flow fields and magnetic flow patterns using existing data to determine if the are the same, or how they differ.

Ideally, we would like to know what aspects of the photopsheric and coronal evolution are necessary and/or sufficient for an eruption to occur? This leads to the Challenge to WG1: "Provide simulated magnetogram and flow field as input to the various techniques used to recover velocity and field information (LCT, multi-scale regularization, extrapolations, MHD modeling etc.)". To meet this challenge Bill Abbett (UCB)

volunteered to provide the necessary simulations while Craig DeForest (SWRI) agreed to run a "hare and hounds" exercise with MHD models to compare results from different events.