WG3: Summery

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1. Scientific Objective

(1) Provide global context for all CME events investigated by the ISEST team:

(2) Investigate processes of the CME initiation, heliospheric propagation, and CMEs interaction

(3) Develop tools to assist collaboration of numerical modelers, theoreticians, and observers

2. Scientific and Modeling Questions

2.1 Initiation of CMEs

2.2 Propagation and interaction of ICMEs

2.3 Impact on Geospace

2.4 Investigation of Mechanisms, Processes, and Forces (with WG2 Theory)

2.5 Forecasting the CME Arrival and Impact (with WG4 Campaign Events)

3. Future Plan and Action Items

In the next 16 months (by the next ISEST workshop), , we will:

(1) Make simulation of the ISEST Event Periods (with WG1) for all (ENLIL model), and for major CME events (COIN-TVD model)

(2) Investigate Mechanisms, Processes, Forces, Energies, and Interactions (with WG2 Theory)

(3) Forecast and validate the CME Arrival and Impact (with WG4 Campaign Events)

(4) Provide standard outputs for observers (synthetic in situ plots and data, height-time plots and data of shock and leading edge of the driver)

4. Overview of the models used in ISEST

(1) ENLIL (sumerian god of wind and storms) model: 1RS-21.5RS, WSA (Wang-Sheeley-Arge), transients: hydrodynamic ejecta (Cone or Rope geometry), heliosphere >21.5 Rs – 3D MHD model

(2) COIN-TVD(Corona-Interplanetary Total Variation Diminishing): 1Rs-beyond 1AU: 3D MHD model, transients: magnetized plasma blob model

(3) H3DMHD: 1RS-21.5RS, HAF (Hakamada-Akasofu-Fry) model >21.5 RS, 3D MHD model

(4) SWMF (Space Weather Modeling Framework, BATSRUS): 1Rs-beyond 1AU: 3D MHD model, transient: analytic magnetic flux rope