Bojan Vršnak: Hvar Observatory
(Faculty of Geodesy, Uni. Zagreb, Croatia)

solar group (5; theory & obs.):

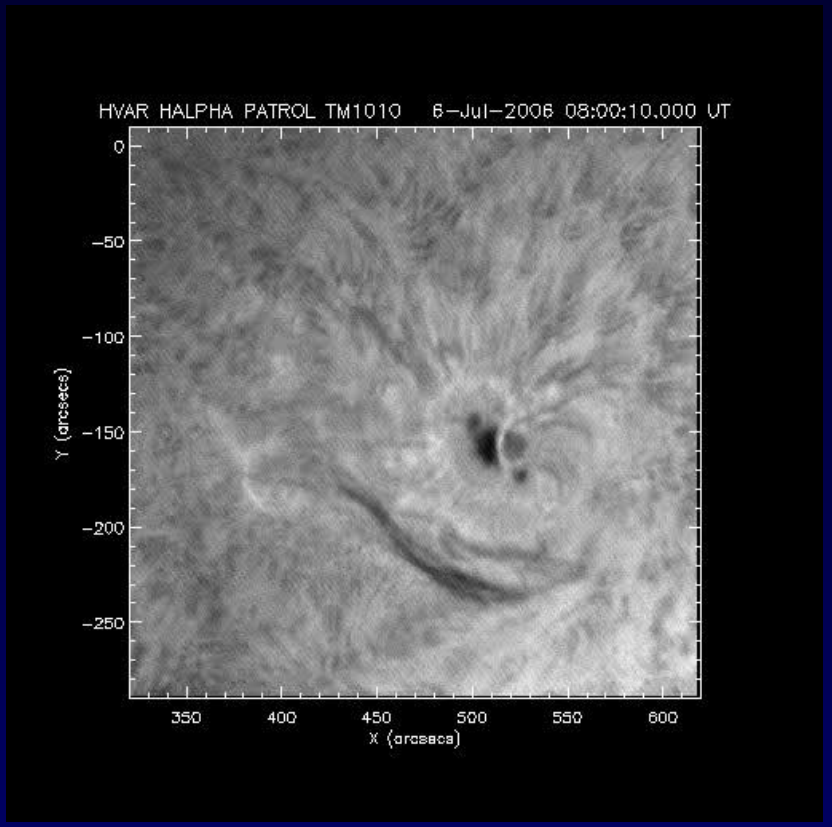
- solar eruptive phenomena
- solar rotation & other large-scale phenomena
- sun-earth connection
  (space weather, **cosmic rays**, climate effects)

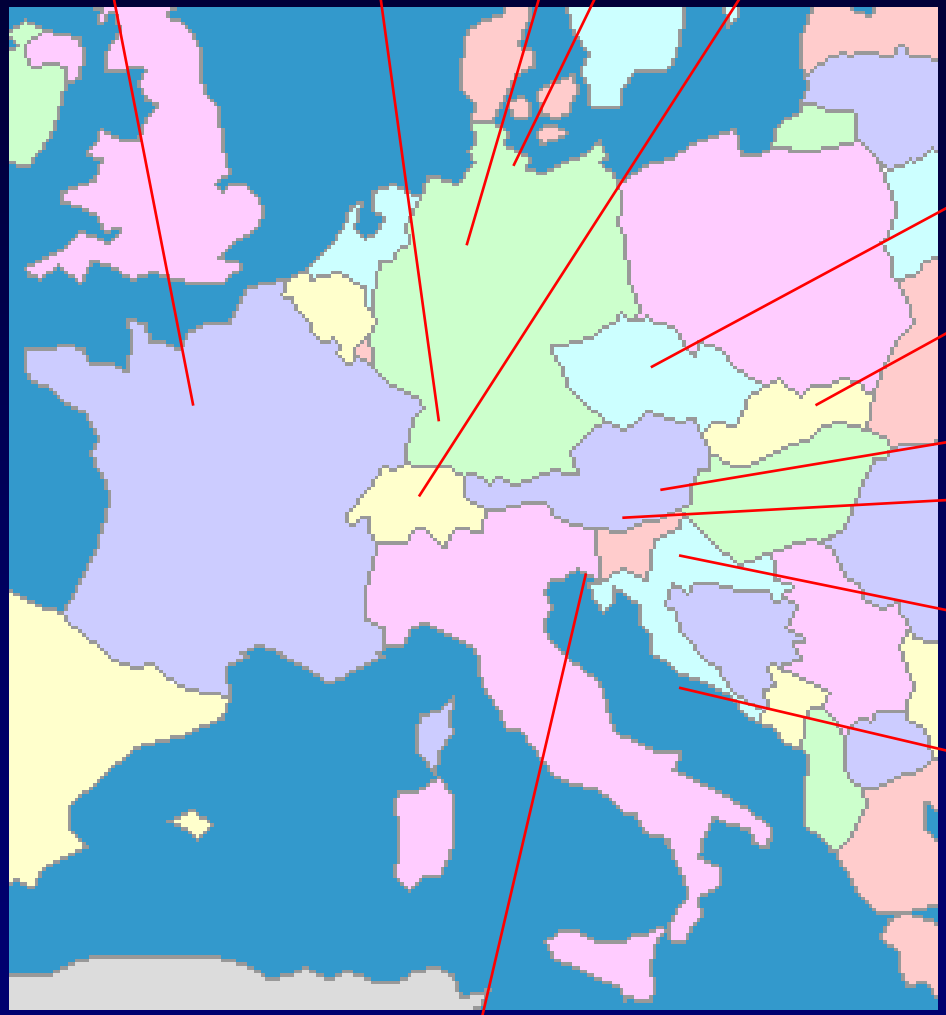
stellar group (4; obs.):

- variable stars
- Be stars
- stellar magnetic activity

equipment:

- double solar t.
- 65 cm photometric t.
- 1 m multi-purpose t.


HVAR HALPHA PATROL TM1010 6-Jul-2006 08:00:10.000 UT
0
-50
-100
-150
-200
-250
Y (arcsecs)
350
400
450
500
550
600
X (arcsecs)



US:
GSFC
AFRL
MLSO
NRL
UAH
...

Take-off and propagation of CMEs and ICMEs:

- loss of equilibrium & acceleration (obs./theor.)
- role of reconnection (obs./theor.)
- aerodynamic drag (obs./theor.)
- interplanetary propagation (Drag-Based Model)
- semi-empirical space-weather forecasting

Reconnection:

- analytical modeling
- post-CME CSs (obs./theor.)
- role of reconnection in CME acceleration (obs./theor.)
- energy-release scaling in flares (obs.)

Coronal shock waves:

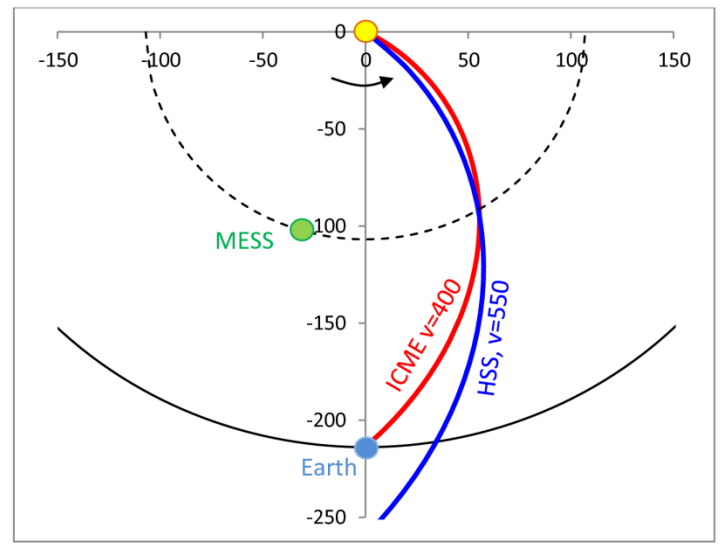
- formation mechanisms (analyt. modeling)
- origin: flare/CME "?" (obs.: type II, Moreton)

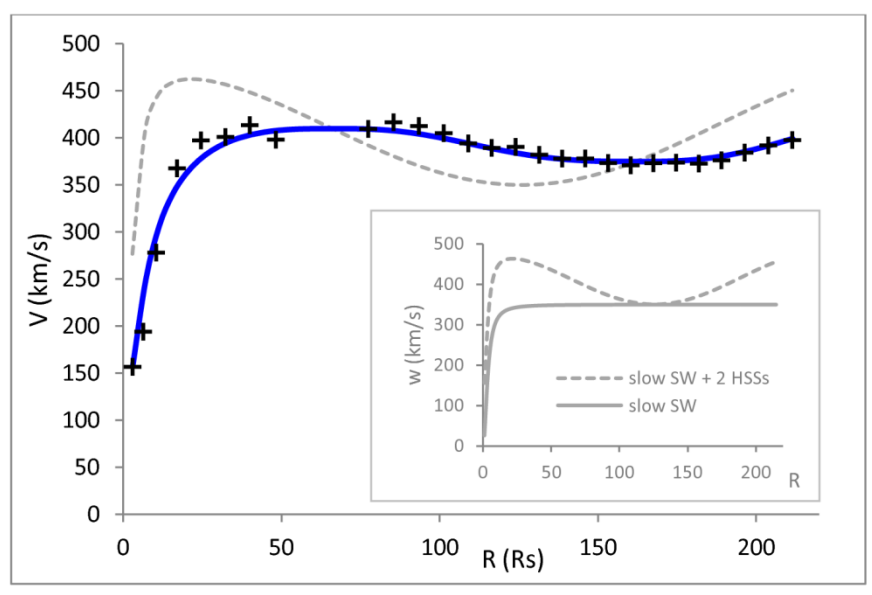
etc.

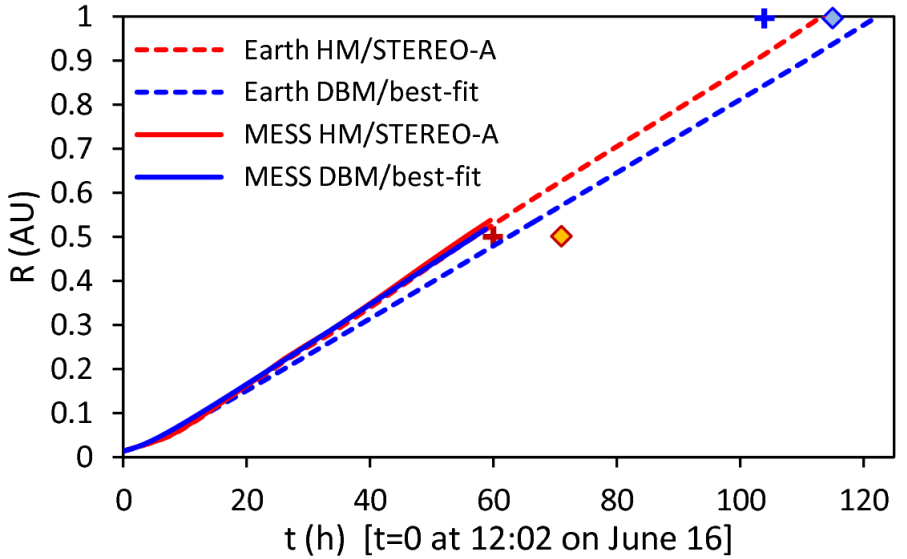
ICMEs – propagation: Drag-Based Model

$$a = -\gamma\,(v\text{-}w)\,|v\text{-}w|$$

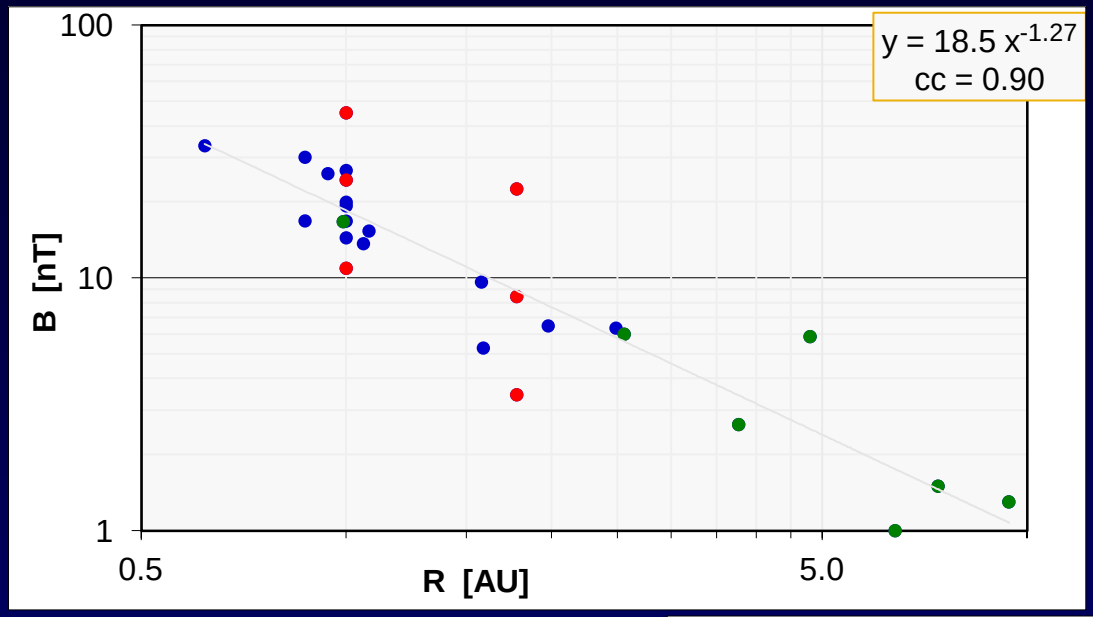
$$[\gamma = c_d A \rho_w / m]$$







ICMEs - evolution



$B_{||} \sim R^{-1.3}$

expected :
$B_{||} \sim R^{-1}$

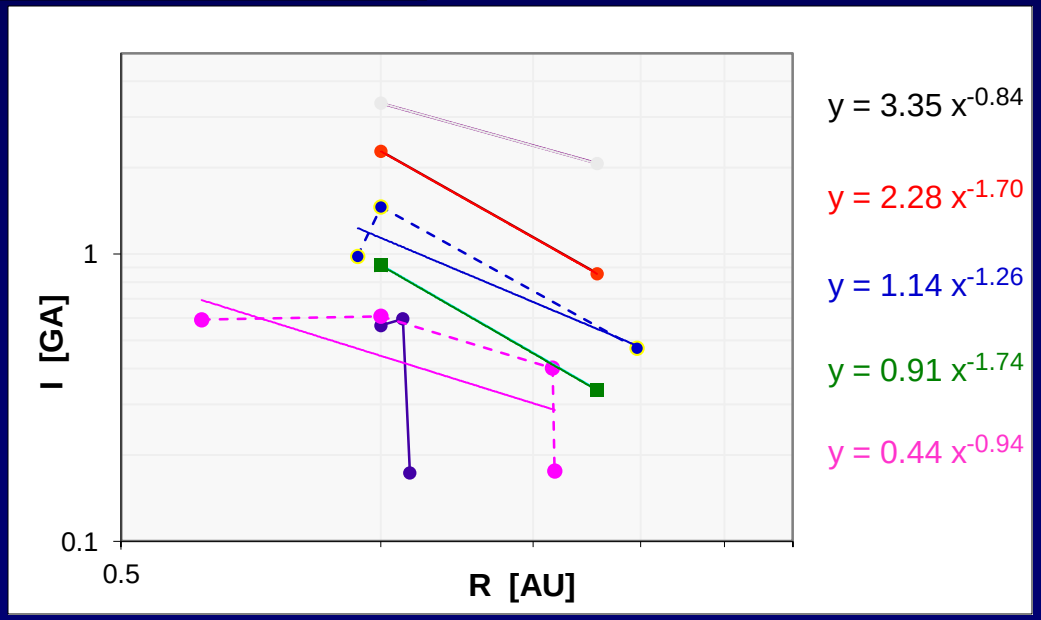
⇒ “erosion”

$I_{||} \sim B_{\phi}\, r$

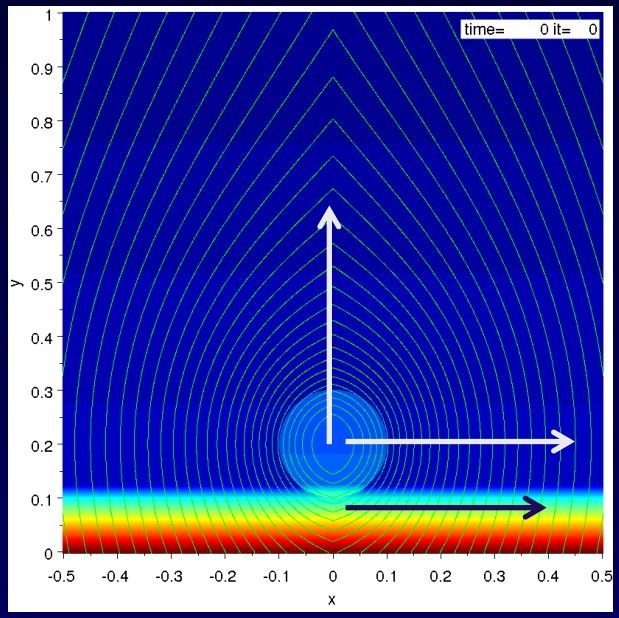
$I_{||} \sim R^{-1.3}$

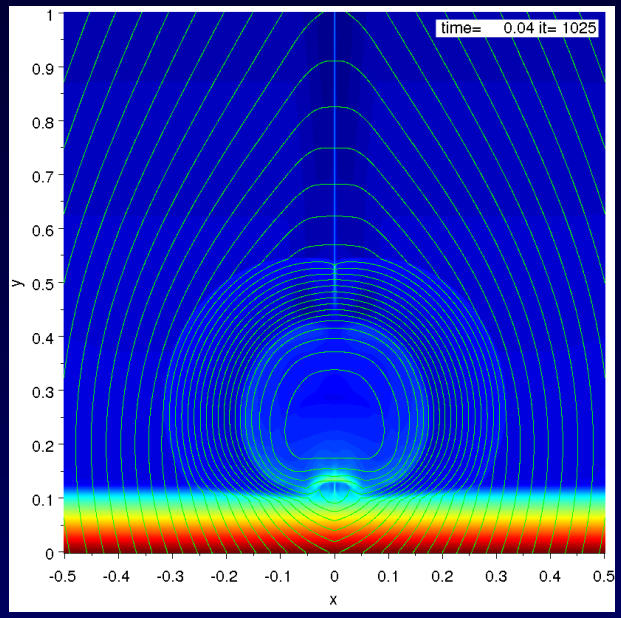
expected :
$I_{||} \sim R^{-1}$

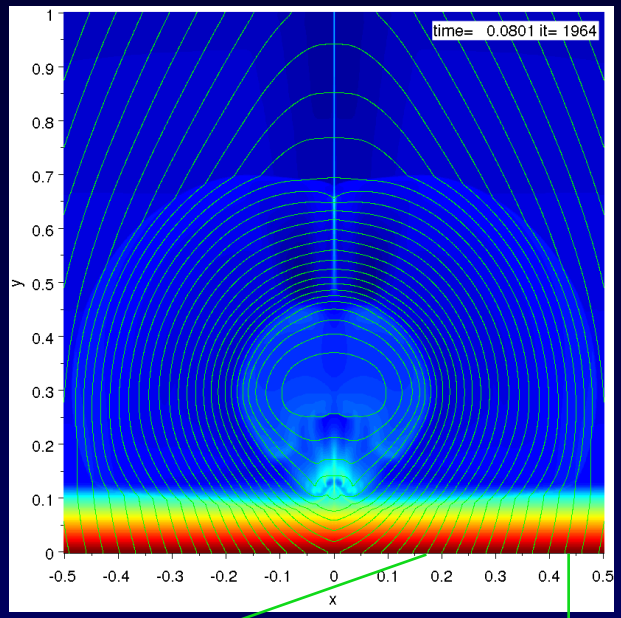
⇒ “erosion”

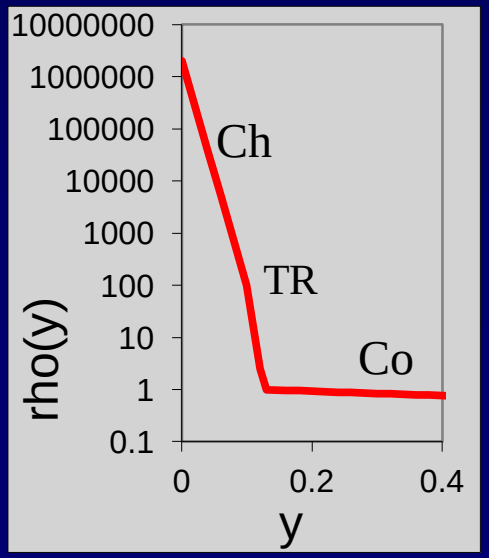


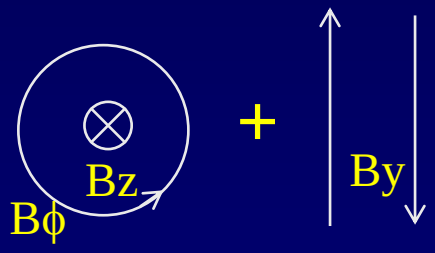
2.5-D MHD simulations: Piston shock

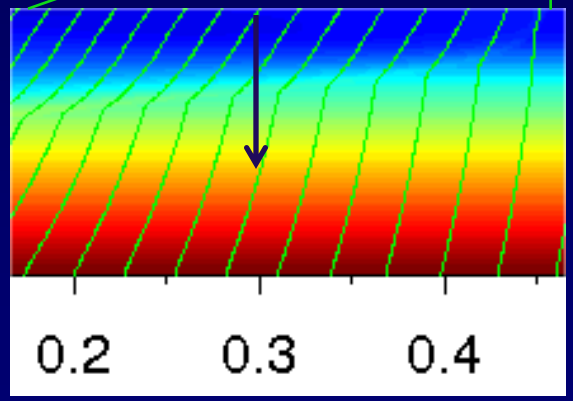


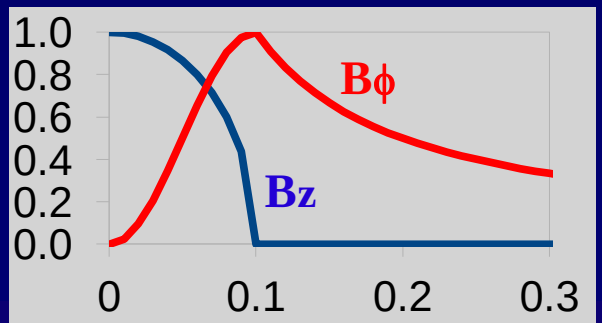












$\beta = 0$

Thank you
for
your attention