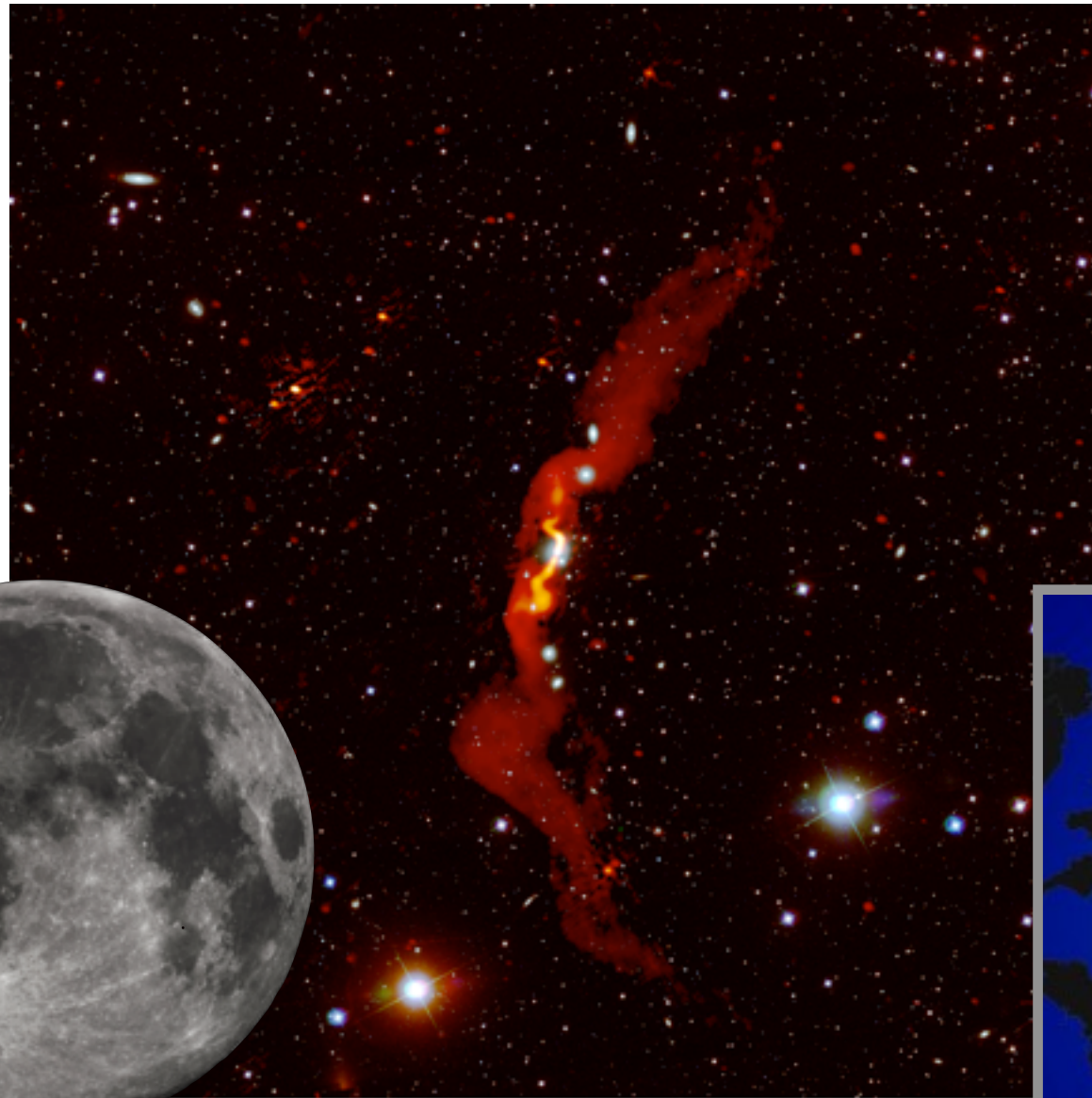


Modelling the outflow of cosmic rays in radio- and star-forming galaxies

3C31:
FRI radio gal.
 $D = 73 \text{ Mpc}$
Linear size:
1 Mpc

Large
FoV!



1 degree = 1.2 Mpc



Map:
LOFAR HBA
145 MHz
16'' resolution



Volker Heesen

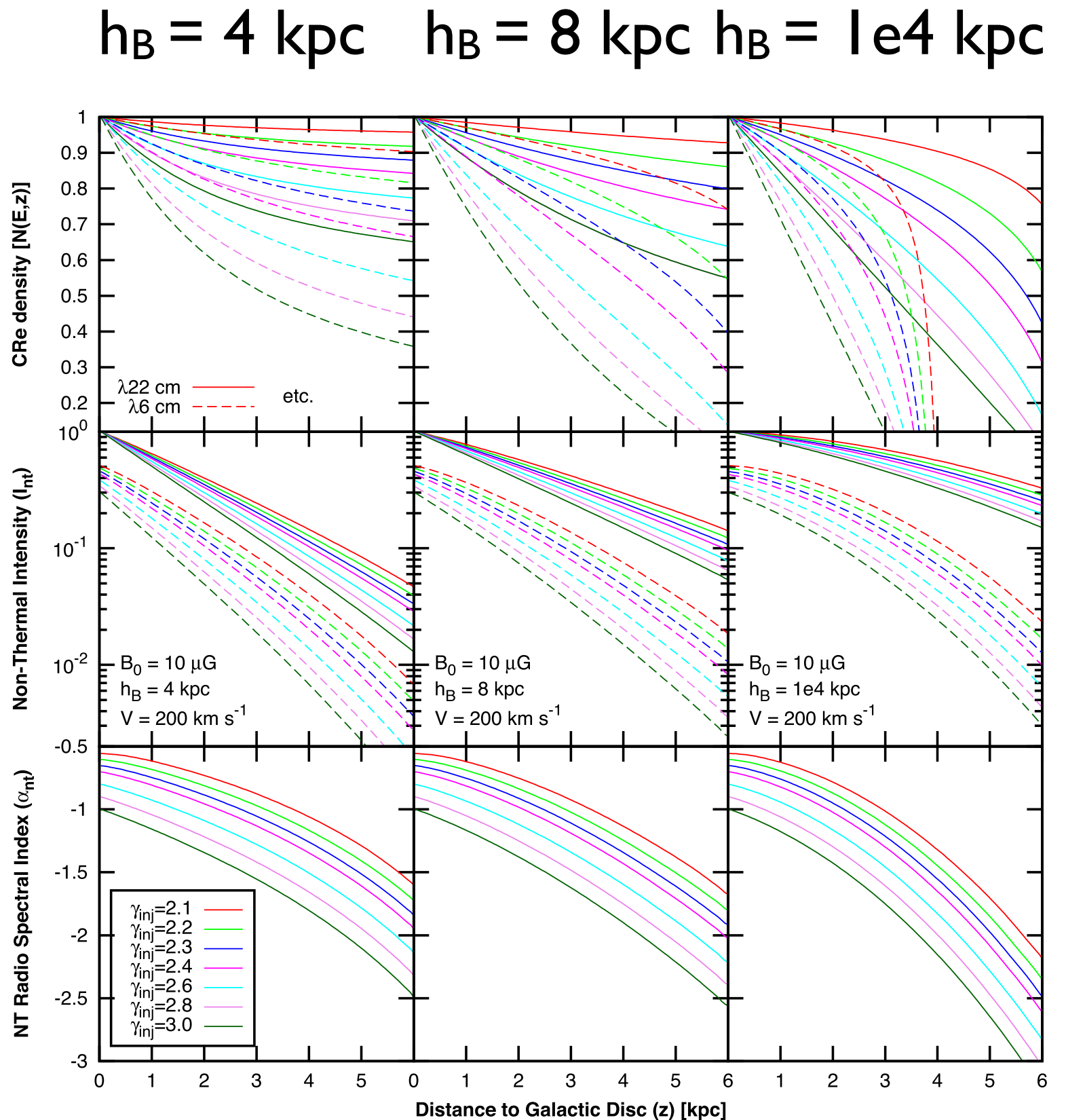
UNIVERSITY OF
Southampton

1D CR advection models

CR density $N(E,z)$

RC intensity $I_{nt}(z)$

Spectral index α_{nt}

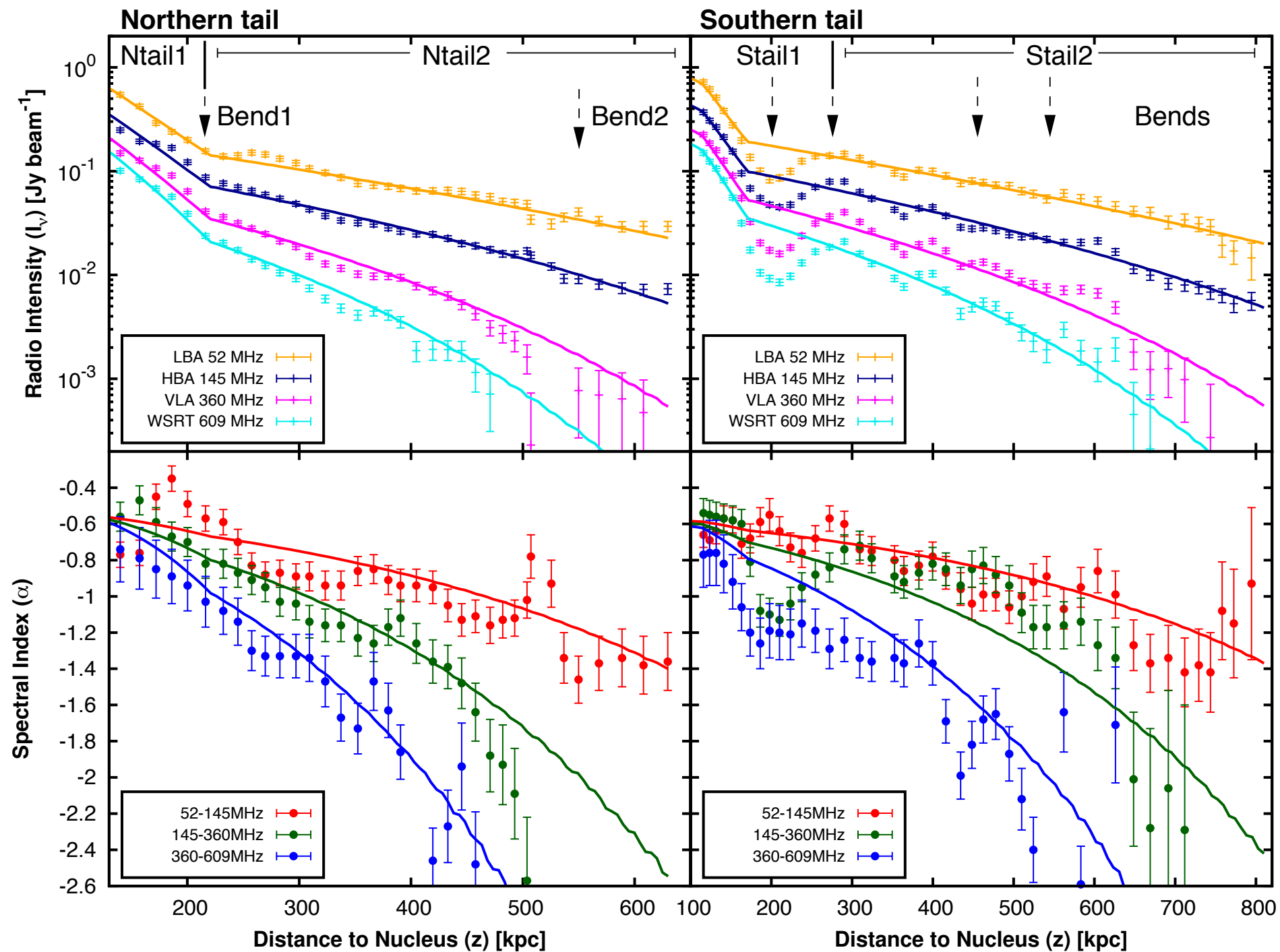


Heesen et al. 2016

Application to 3C31

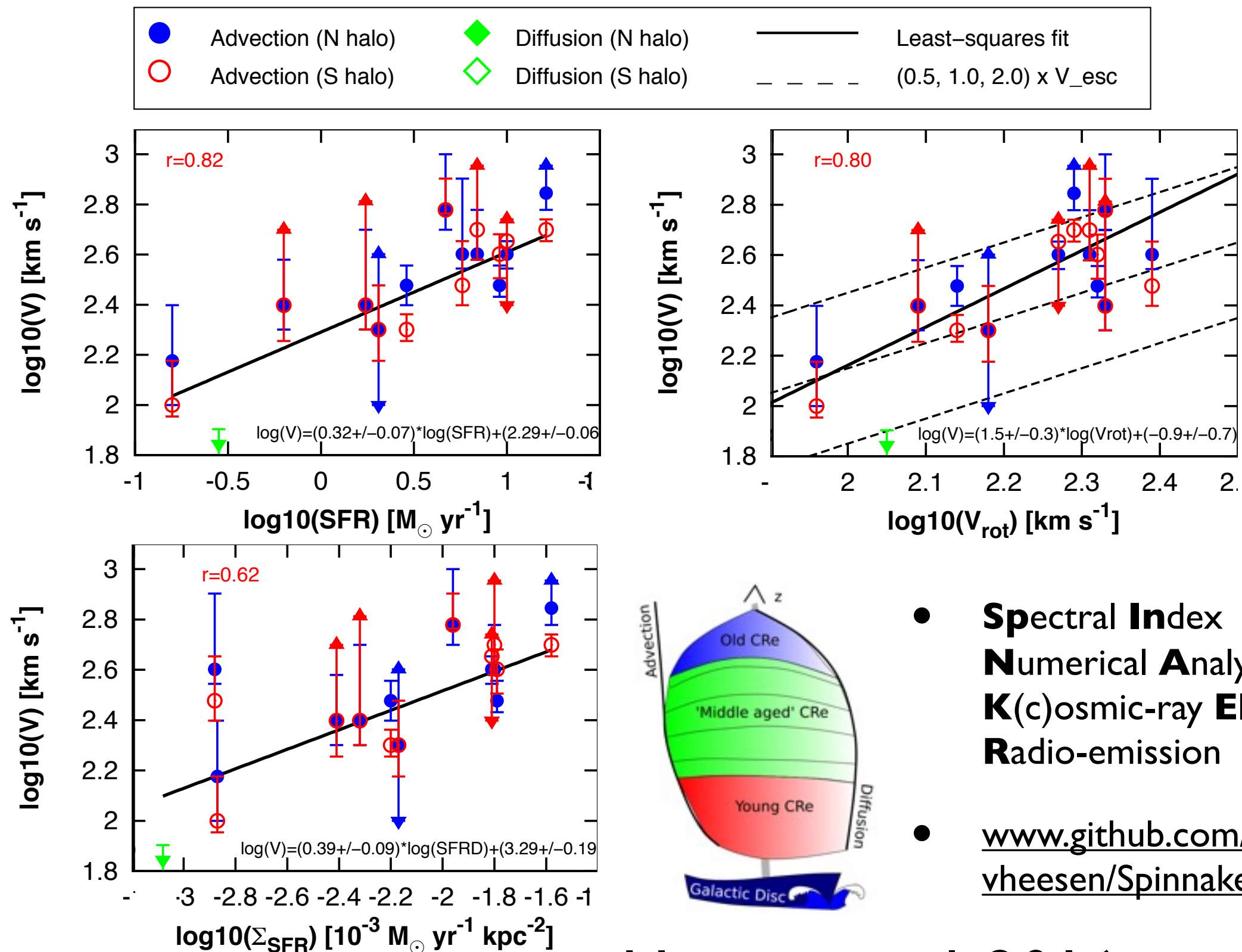
$V = 2000 \text{ km s}^{-1}$

$V = 3000 \text{ km s}^{-1}$



Heesen et al. 2016, submitted

Application to star-forming galaxies



Heesen et al. 2016, in prep.