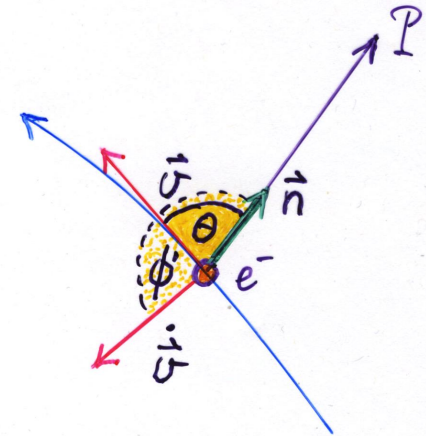
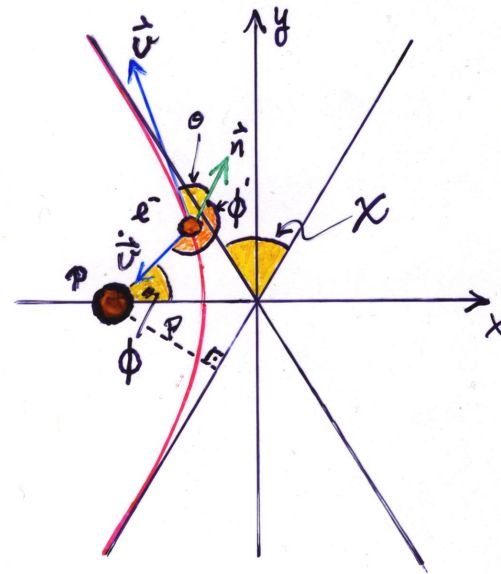


# Continuum radiation processes

geometry for accelerated charged particle



free-free radiation and geometry  
for a thermal electron  $e^-$  passing  
a proton  $p$

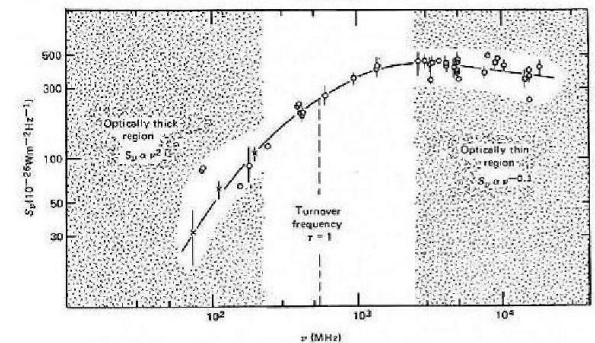
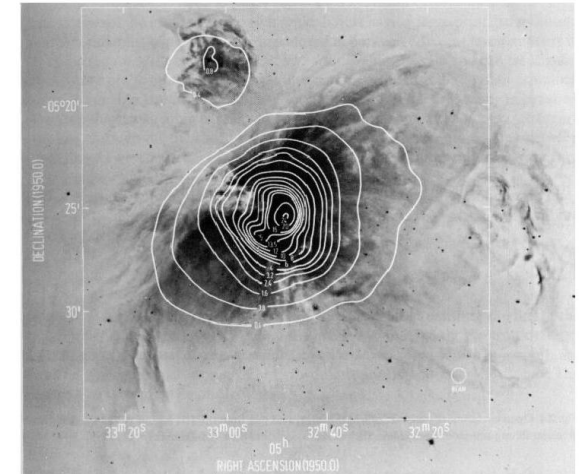


# Continuum radiation processes

free-free radiation from the Orion nebula



Orion Nebula: Balmer line and free-free emission



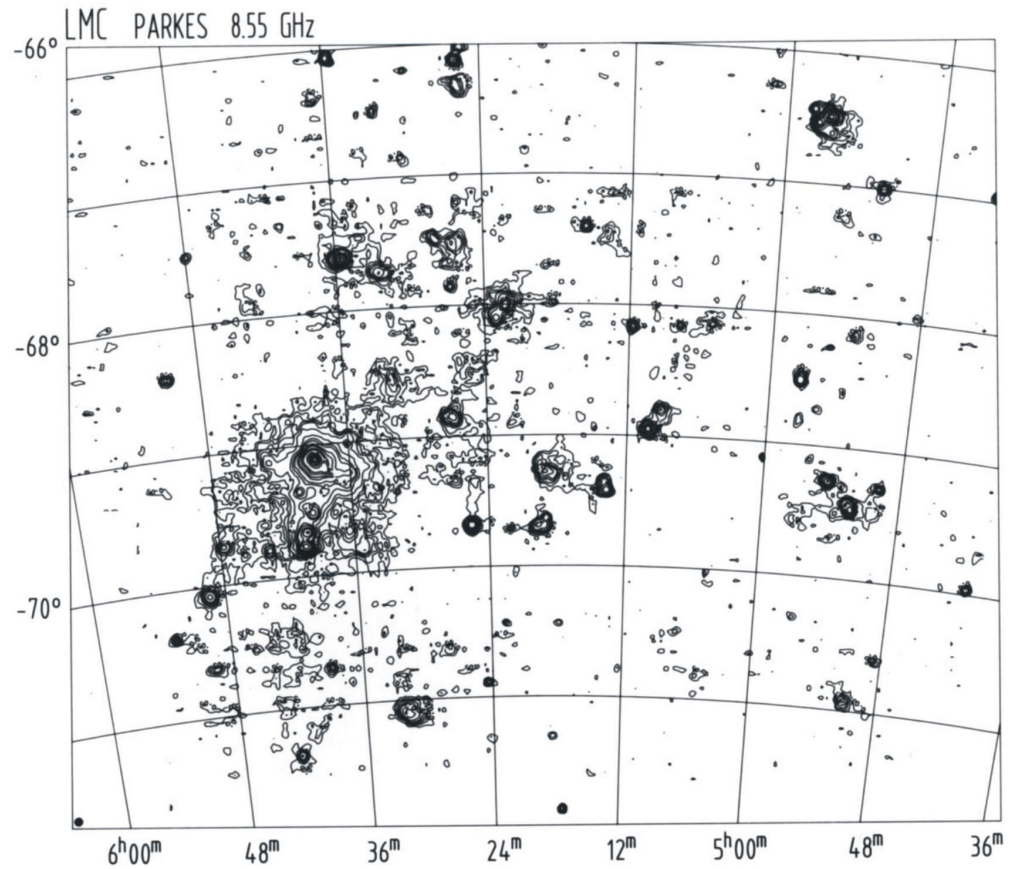
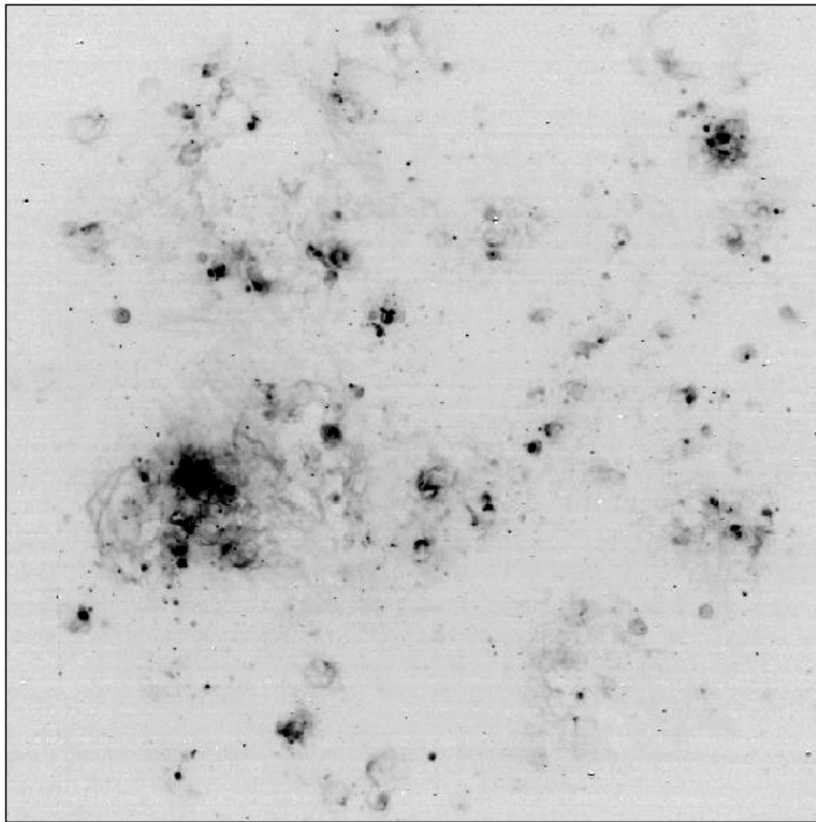
left : optical image

upper right : H $\alpha$ , superimposed by contours of free-free radiation at 5 GHz

lower right : radio continuum spectrum, exhibiting the turn-over at which the optical depth  $\tau \approx 1$

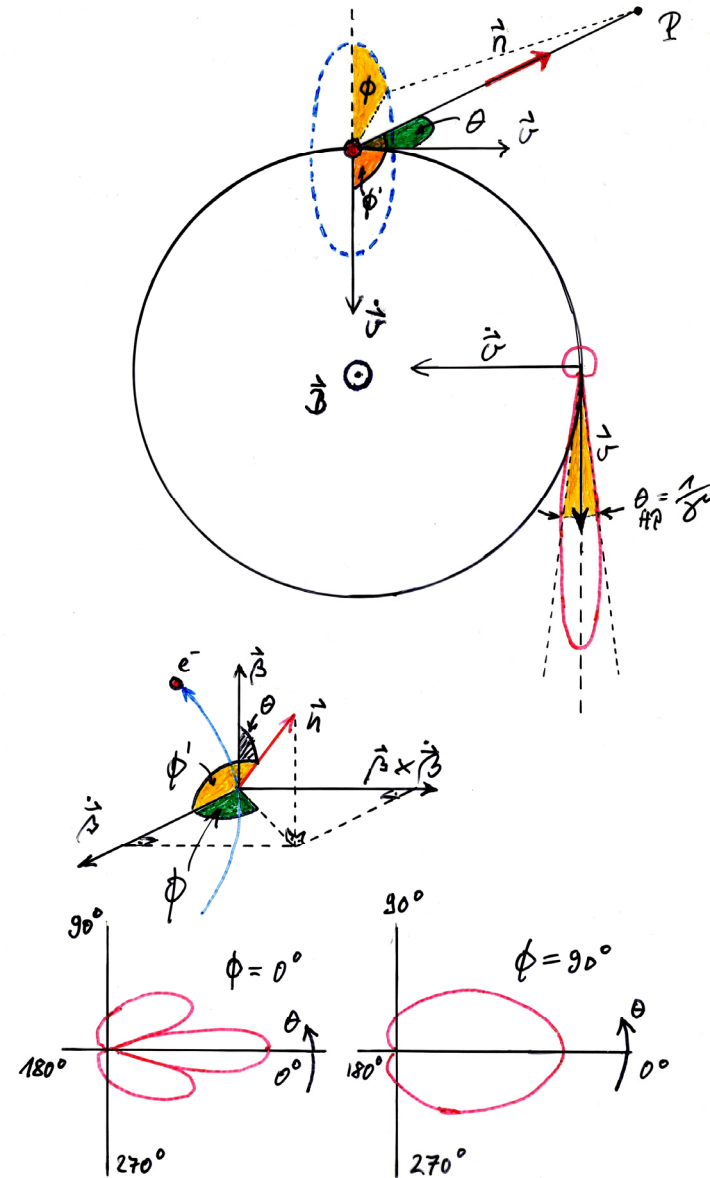
# Continuum radiation processes

H $\alpha$  and thermal radio emission of the Large Magellanic Cloud (Klein et al.)



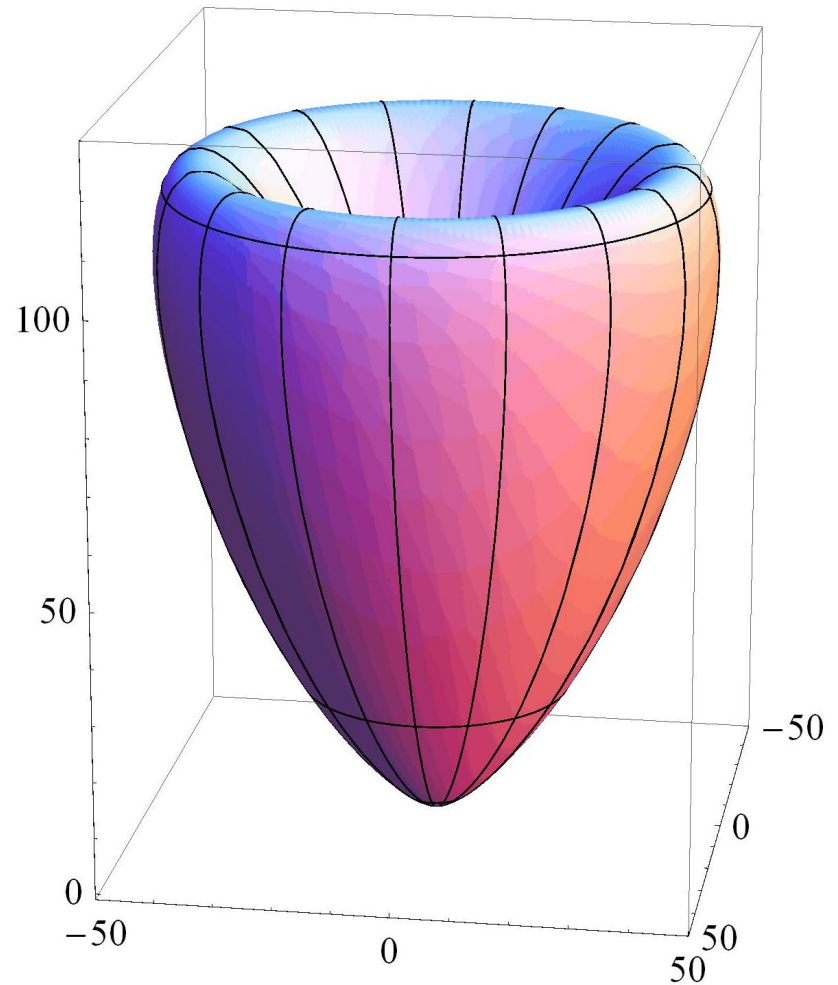
# Continuum radiation processes

synchrotron radiation and geometry for a relativistic electron spiralling around a magnetic field  $B$  pointing towards us



# Continuum radiation processes

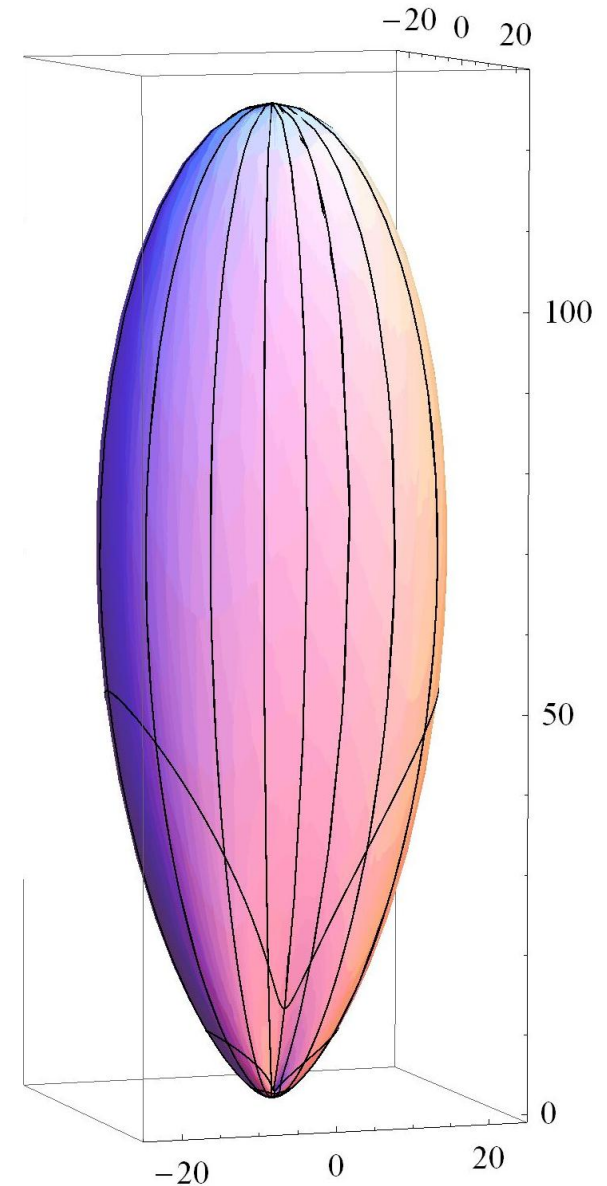
radiation pattern of linearly  
accelerated charged particle  
for  $\beta = 0.8$





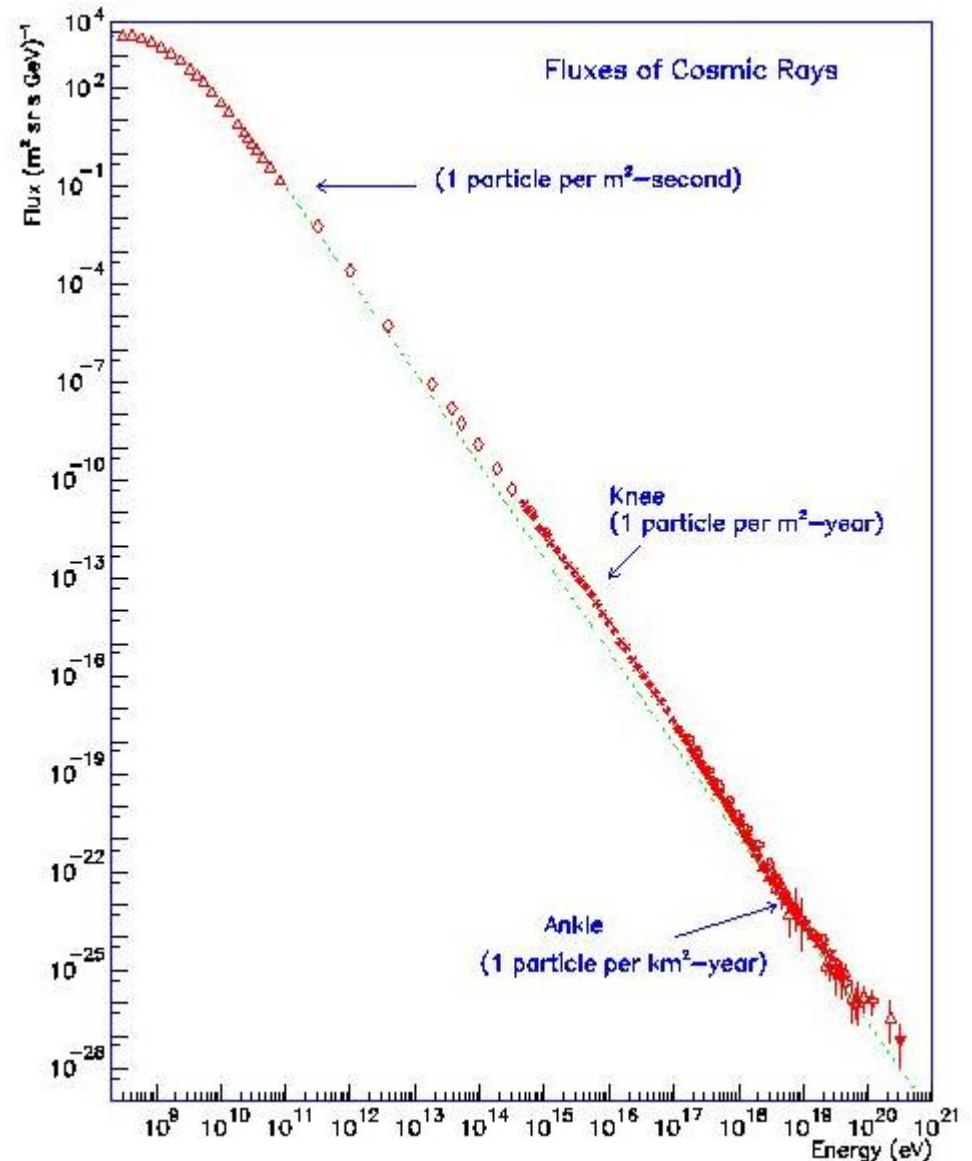
# Continuum radiation processes

radiation pattern of transversely accelerated charged particle for  $\beta = 0.8$



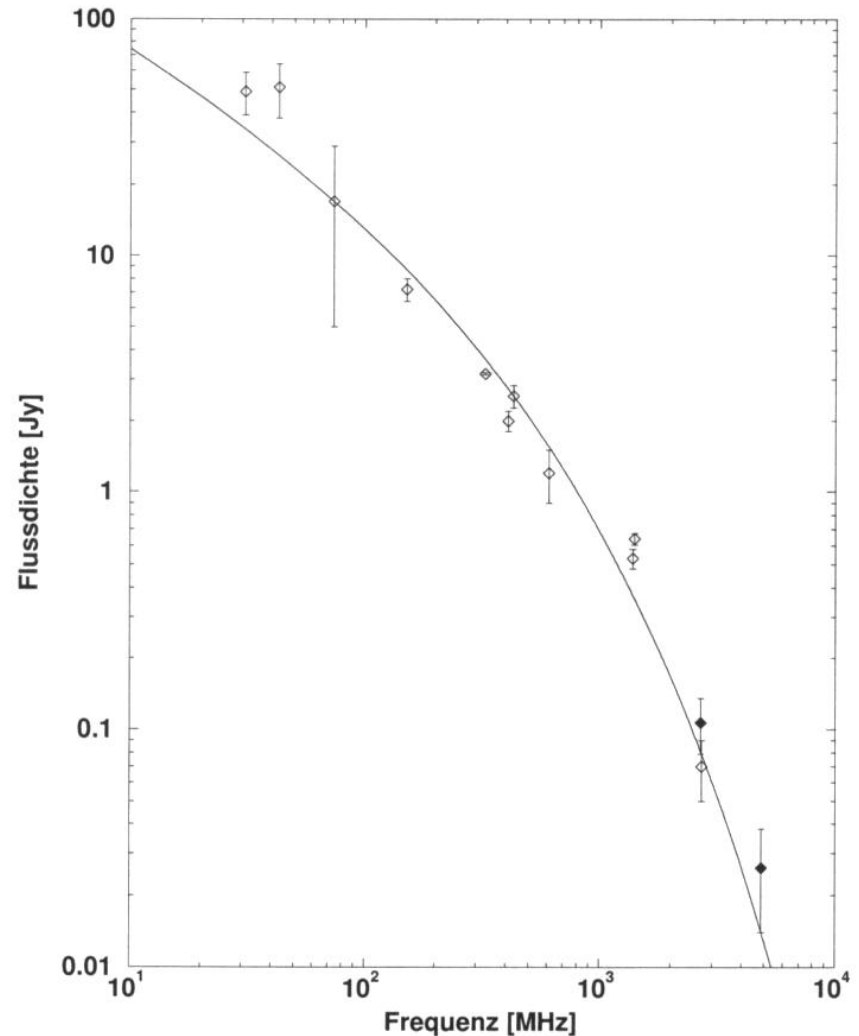
# Continuum radiation processes

energy spectrum of cosmic rays near earth (this enters the calculation of the synchrotron emissivity)



# Continuum radiation processes

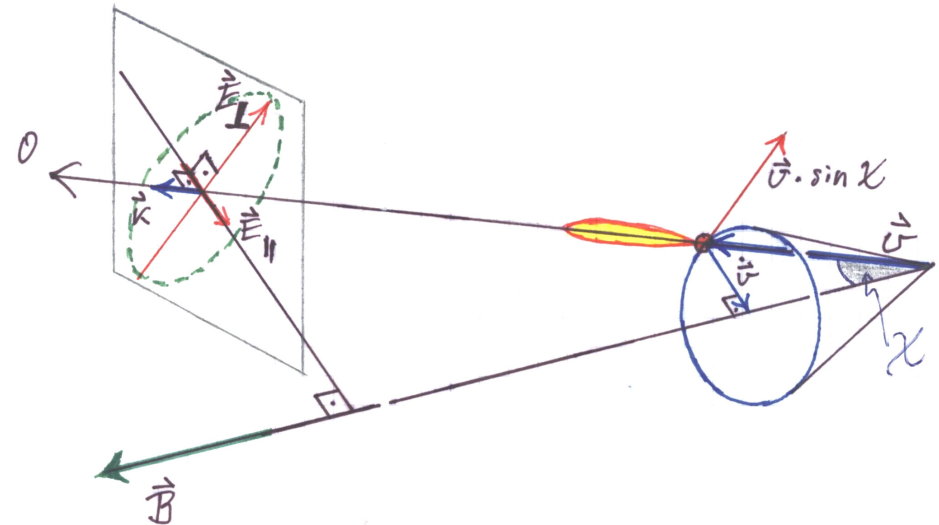
integrated synchrotron radiation spectrum of the Coma cluster of galaxies, showing the location of the break frequency in the GHz frequency regime (Thierbach et al.)



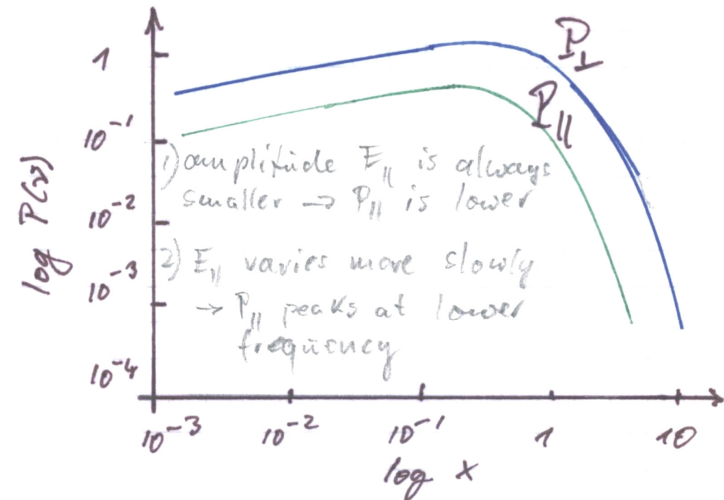


# Continuum radiation processes

Geometry of polarisation of a synchrotron-emitting relativistic particle

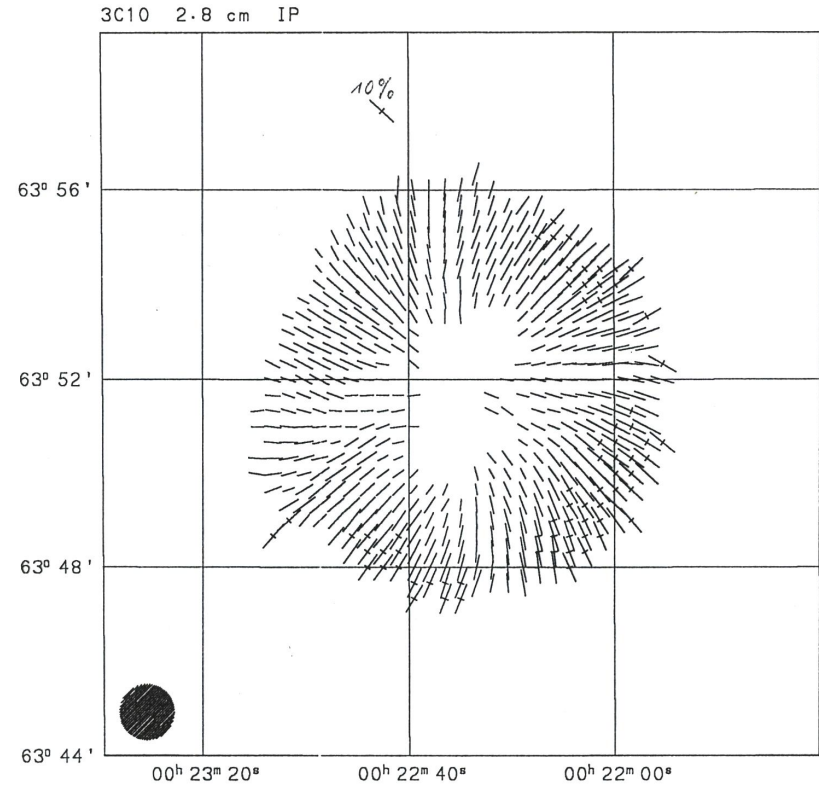
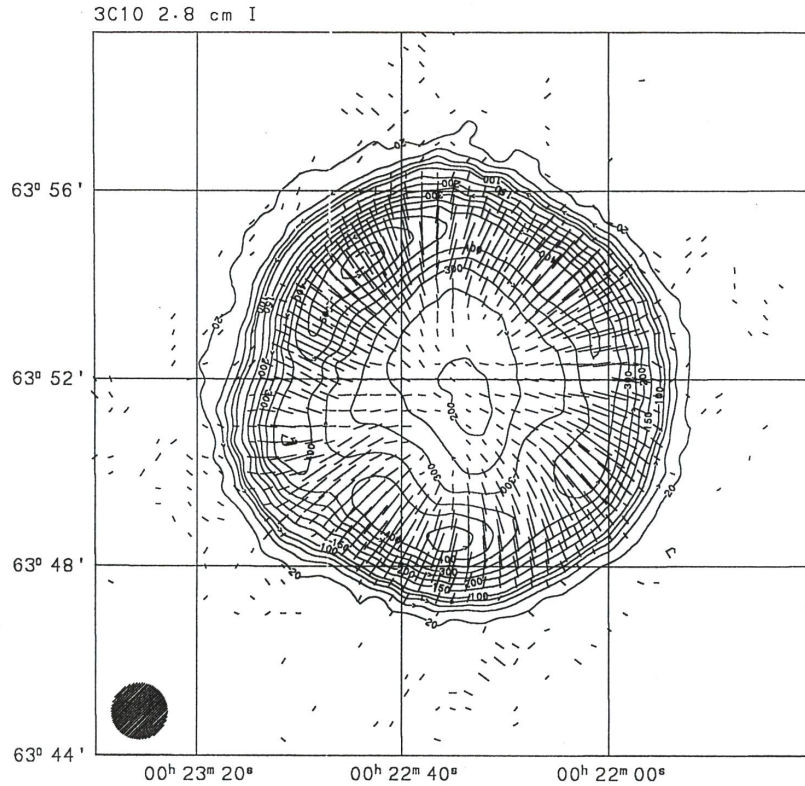


Frequency power spectrum of the electric fields parallel and perpendicular to the magnetic field



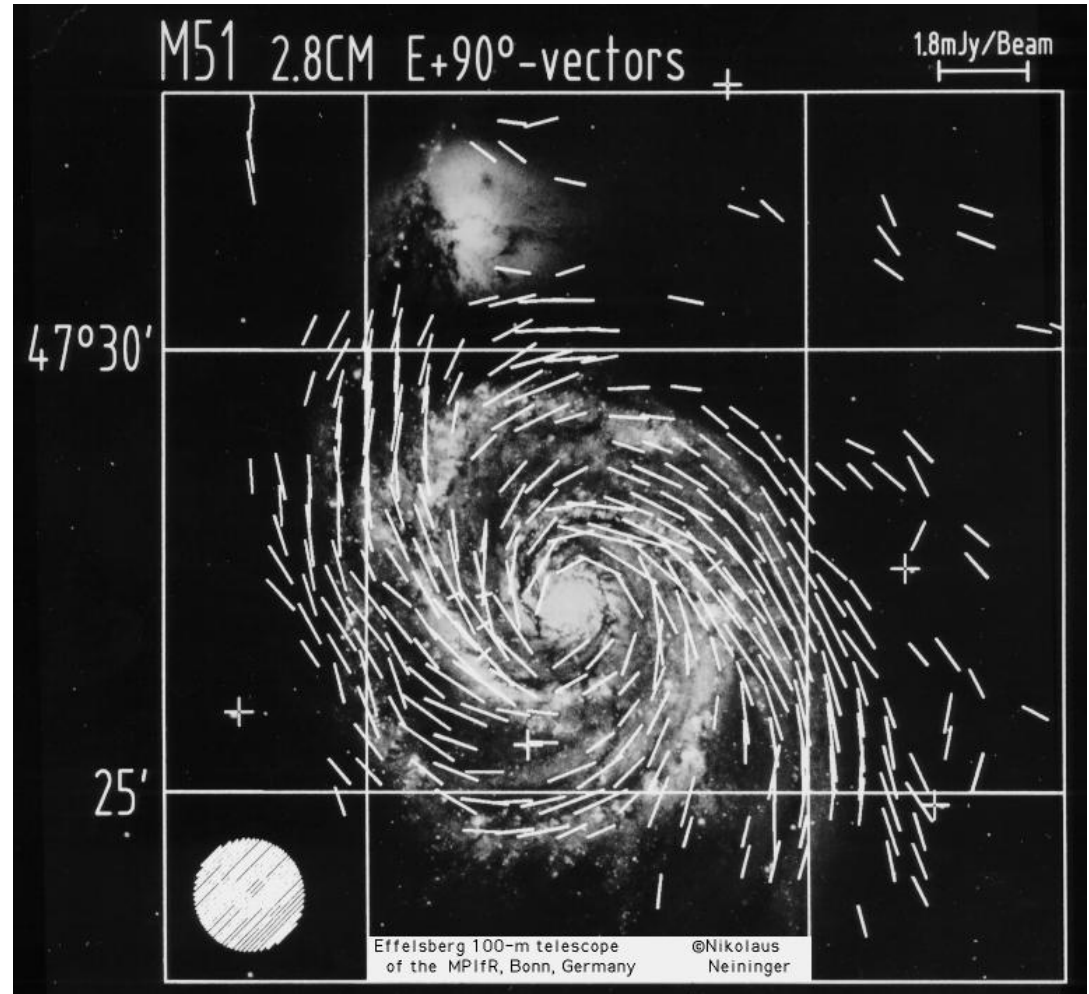
# Continuum radiation processes

synchrotron radiation and magnetic field of the SNR 3C10 (“Tycho’s supernova”; Klein et al.)



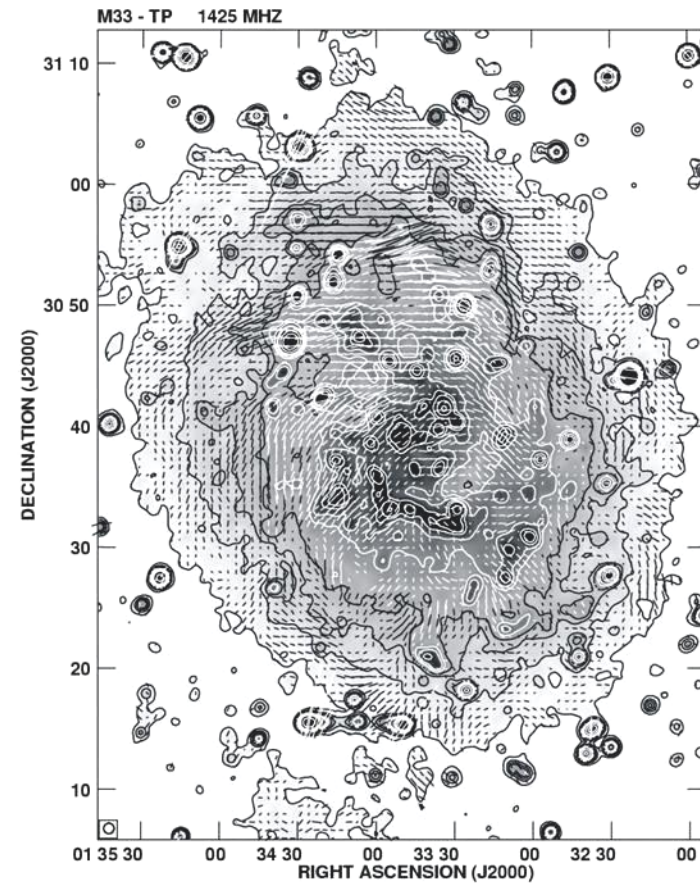
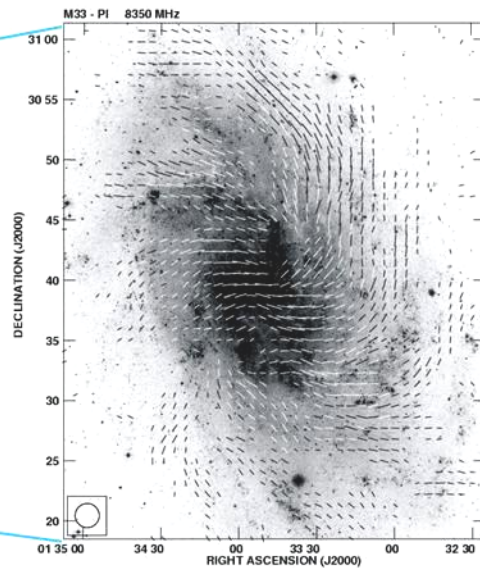
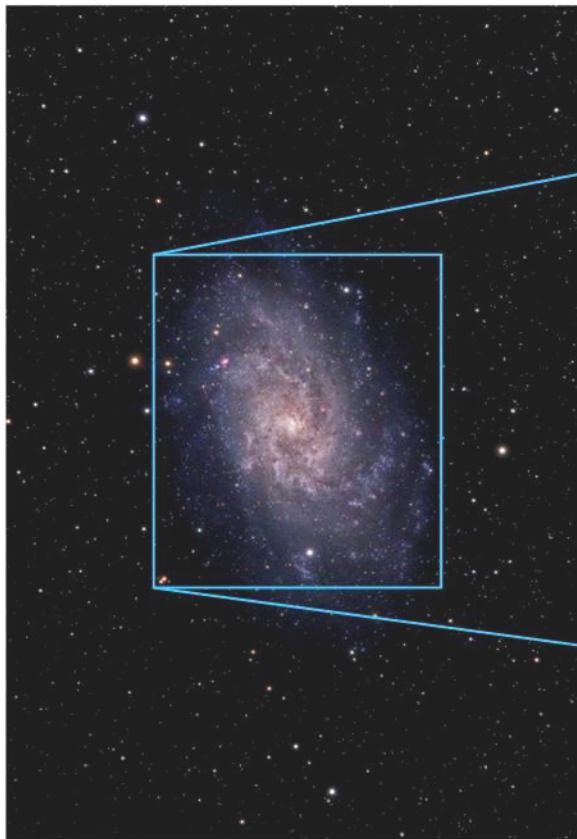
# Continuum radiation processes

morphology of the magnetic field in the spiral galaxy  
M51 from radio polarization measurements (Neininger)



# Continuum radiation processes

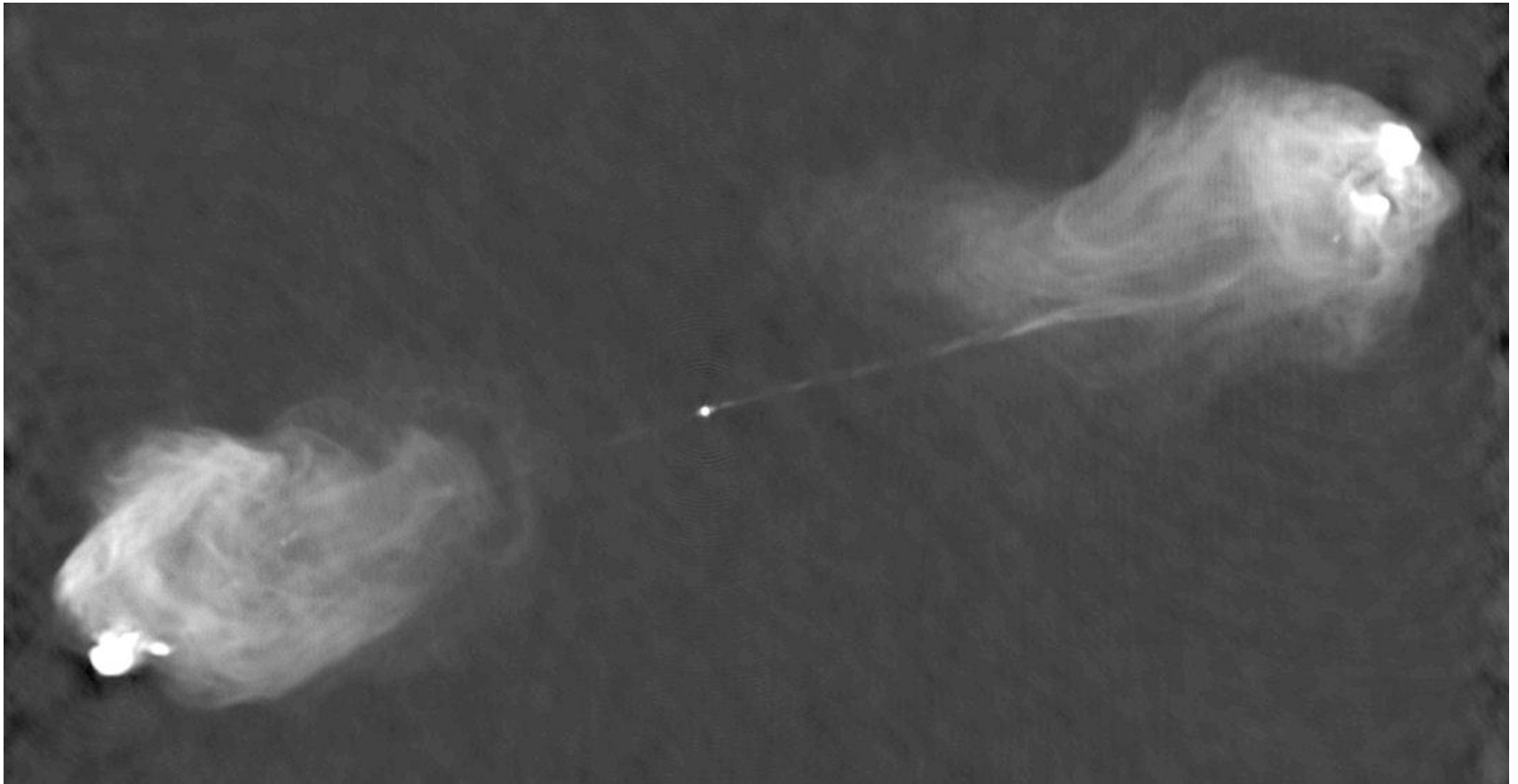
Synchrotron radio emission and magnetic field in M33 (Tabatabaei et al.)





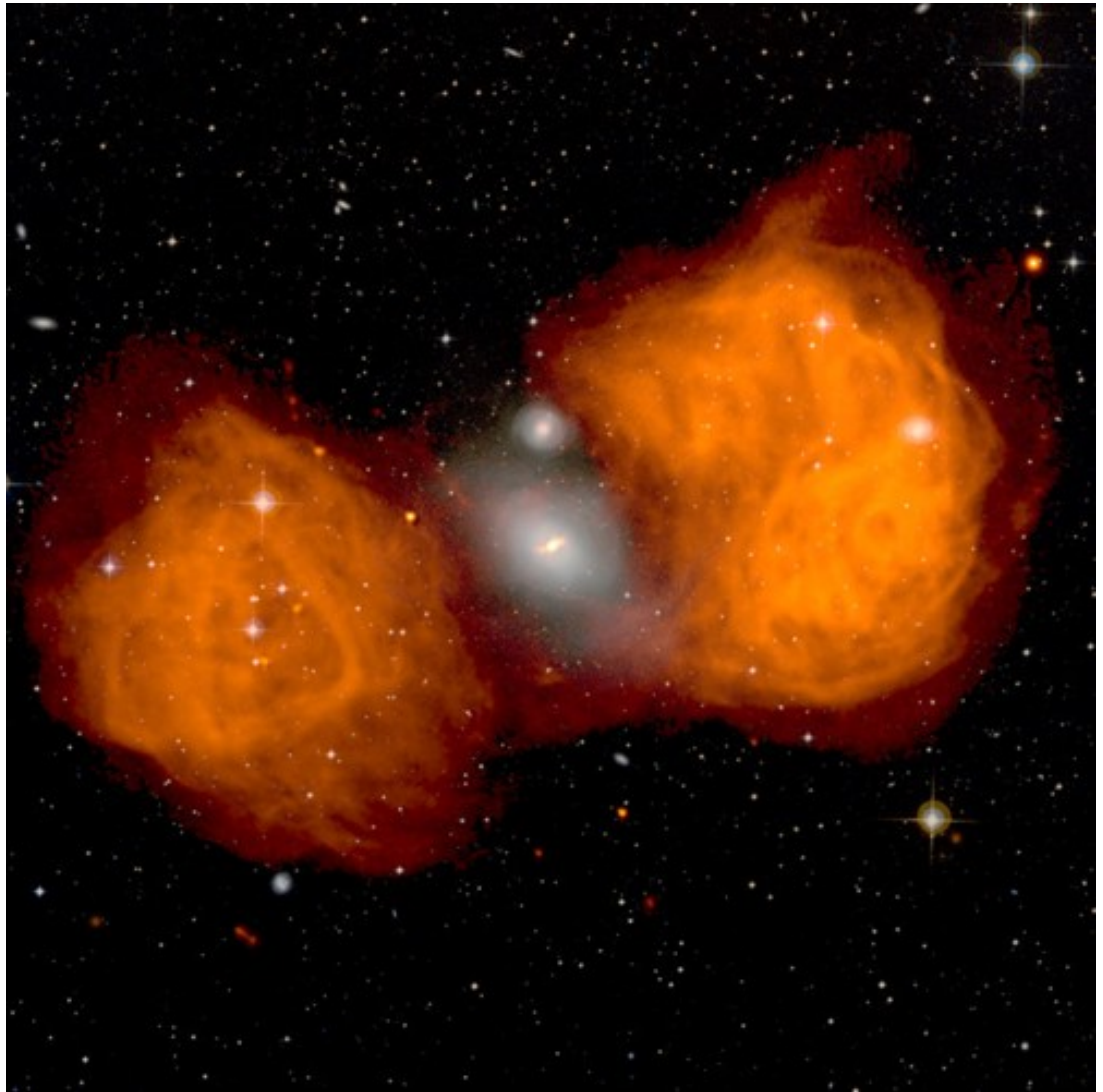
# Continuum radiation processes

synchrotron radiation from the radio galaxy Cygnus A (Perley et al.)



# Continuum radiation processes

synchrotron radiation from  
the radio galaxy Hydra A,  
superimposed onto an  
optical image (Ekers et al.)





# Continuum radiation processes

Synchrotron (radio, contours) and Inverse-Compton (X-ray, colour) radiation from the radio galaxy 3C294 (Erlund et al.)

