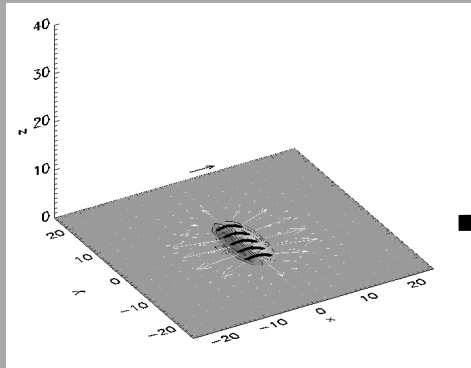
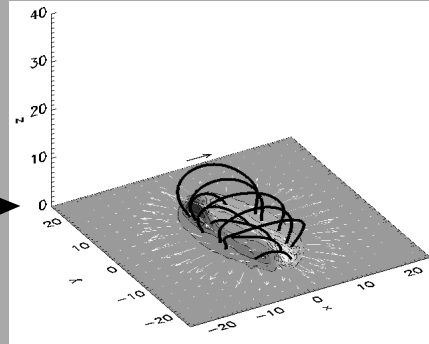


# Magnetic & flow structure produced by emerging twisted flux tube

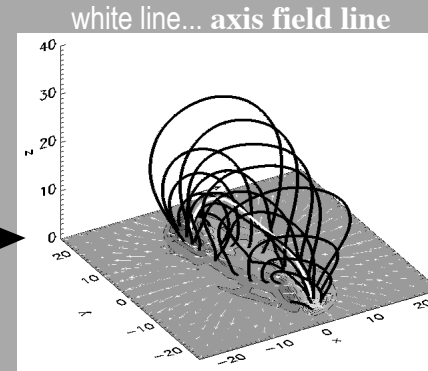
**3D view** (magnetic field lines (black lines) & flows (white arrows))



**Early state**

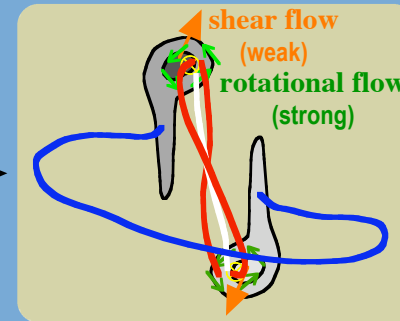
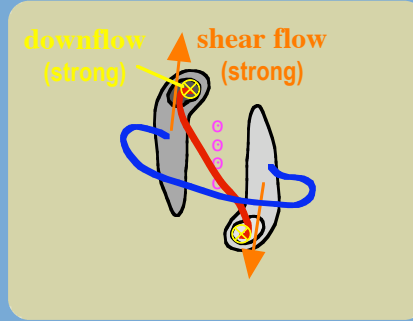
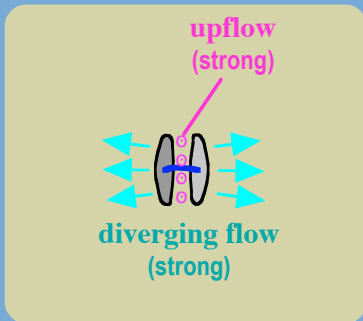


**Developing state**



**Developed state**

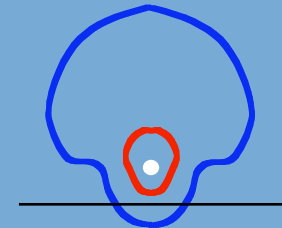
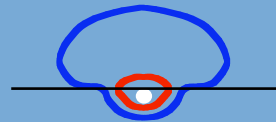
**Top view** (magnetic polarity regions & flows at solar surface)



**Side view** (cross section)

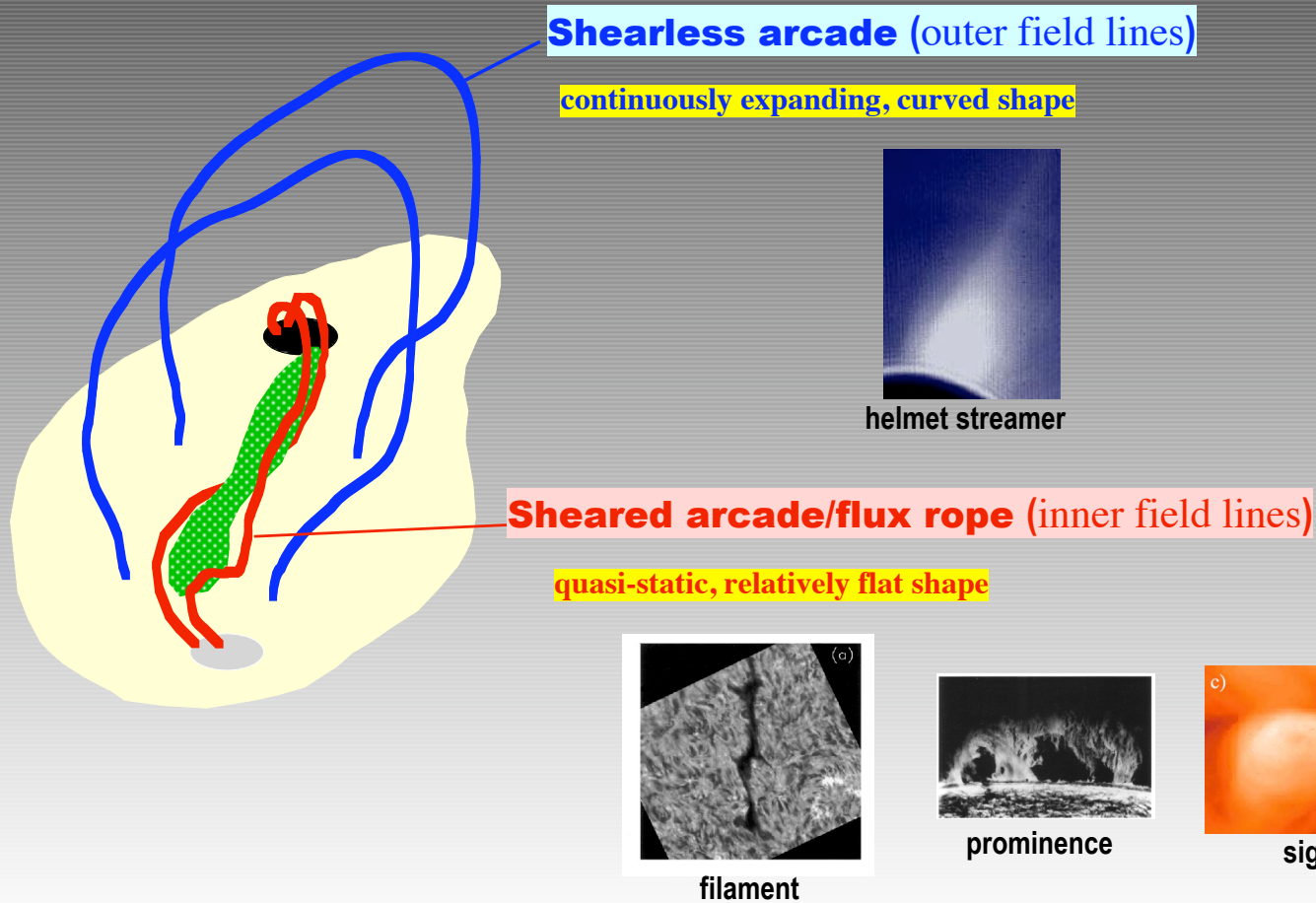


blue... outer field  
red... inner field  
white... axis field line



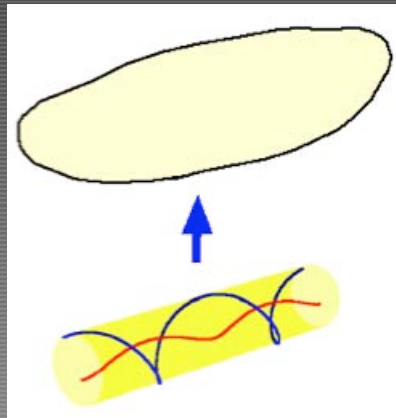
# Structurization in emerging twisted flux tube (Developed state):

**Expanding shearless arcade + Quasi-static sheared arcade**



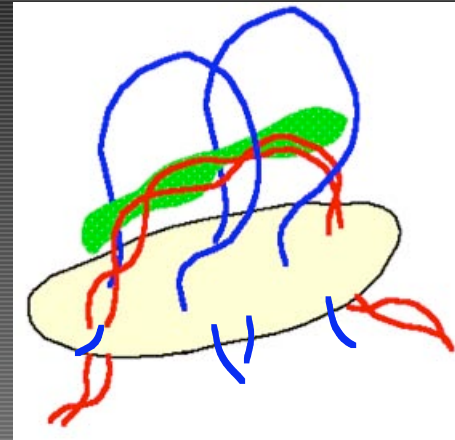
# Coronal magnetic structure

## Coronal magnetic structure formed via flux emergence...



### Below solar surface...

magnetic field takes the shape of a thin flux tube because the gas pressure of a surrounding plasma is **high**.

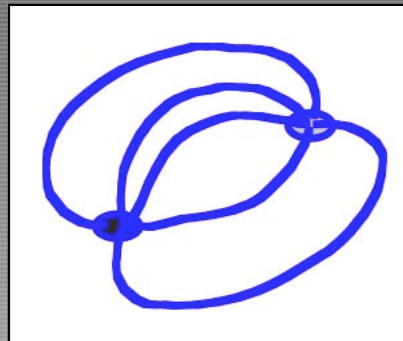
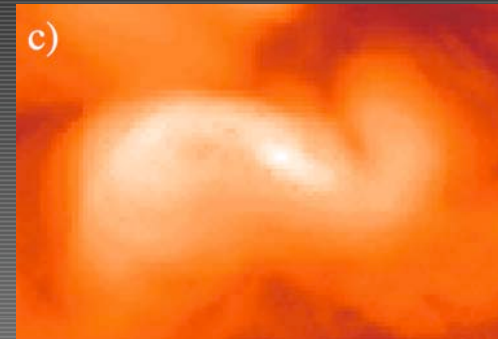
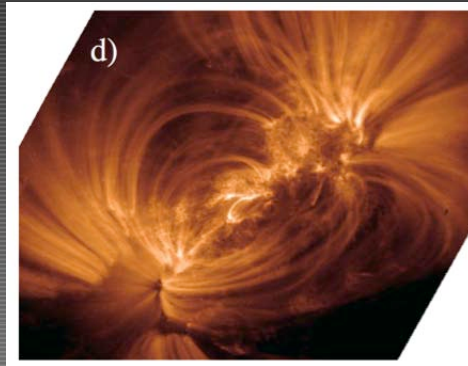


### Above the surface...

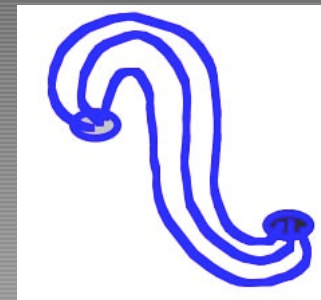
magnetic field expands rapidly to form coronal magnetic structure because the gas pressure of a surrounding plasma is **low**.

*Typical magnetic field configurations of coronal magnetic structure:*

**Sheared (twisted) or Shearless**



**Potential field-like structure**  
shearless



**Sigmoidal structure**  
sheared (twisted)

*What gives shear (twist) to coronal magnetic structure?*

Field-aligned current (FAC)