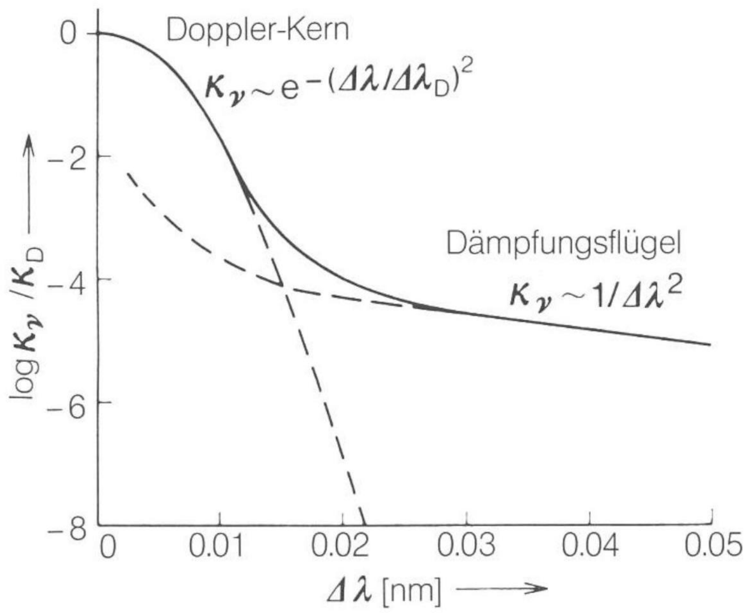
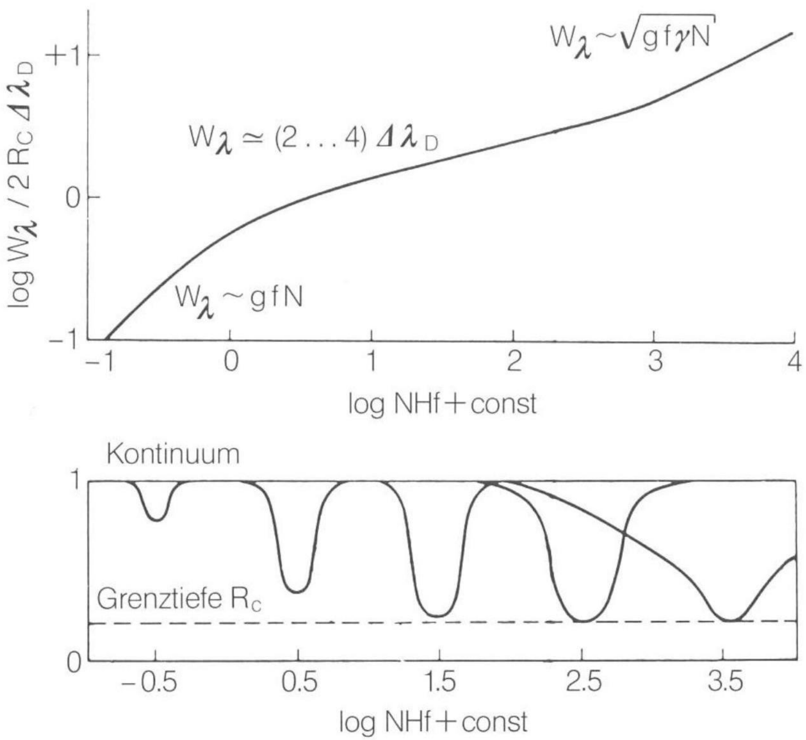
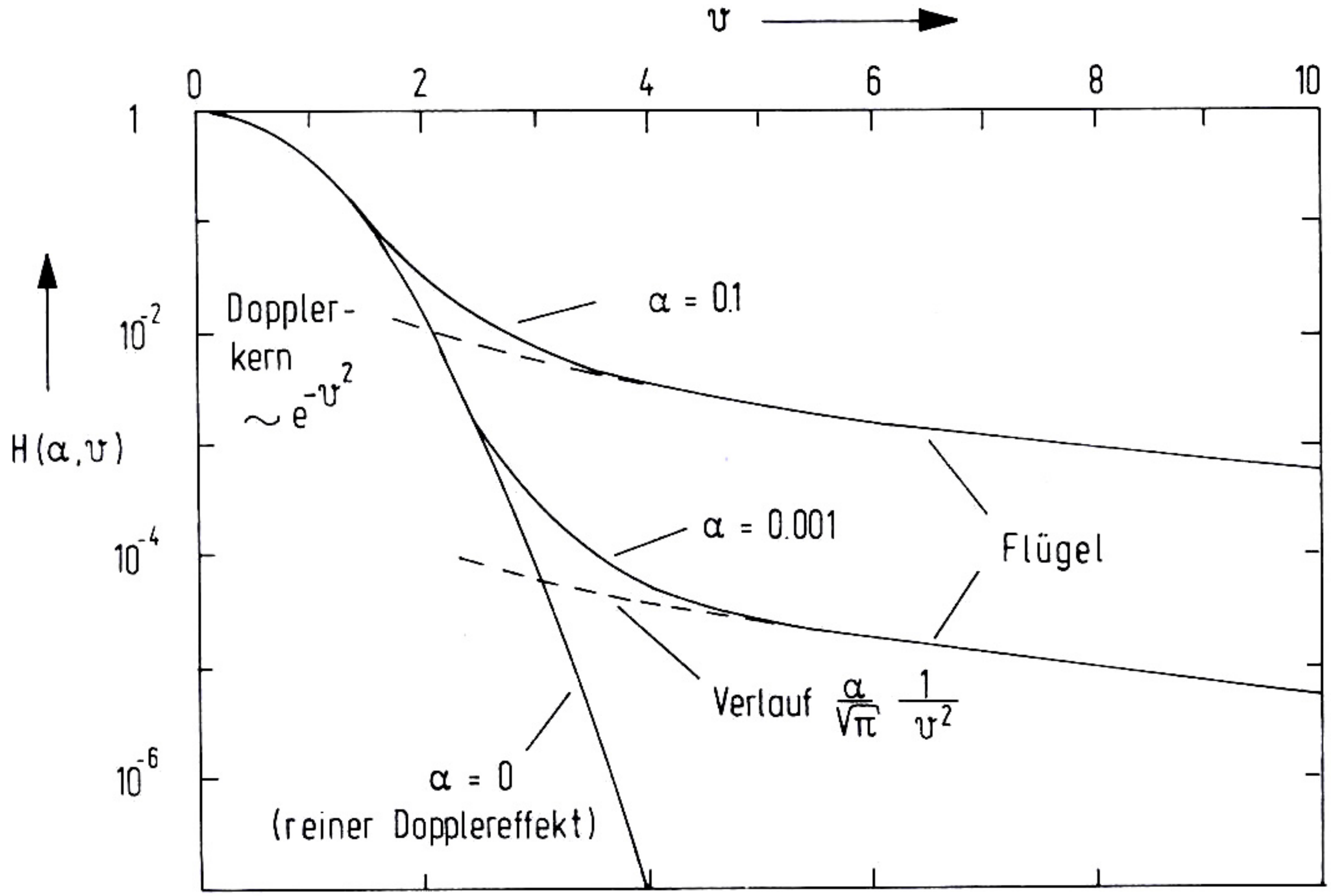
Line shape and curve of growth





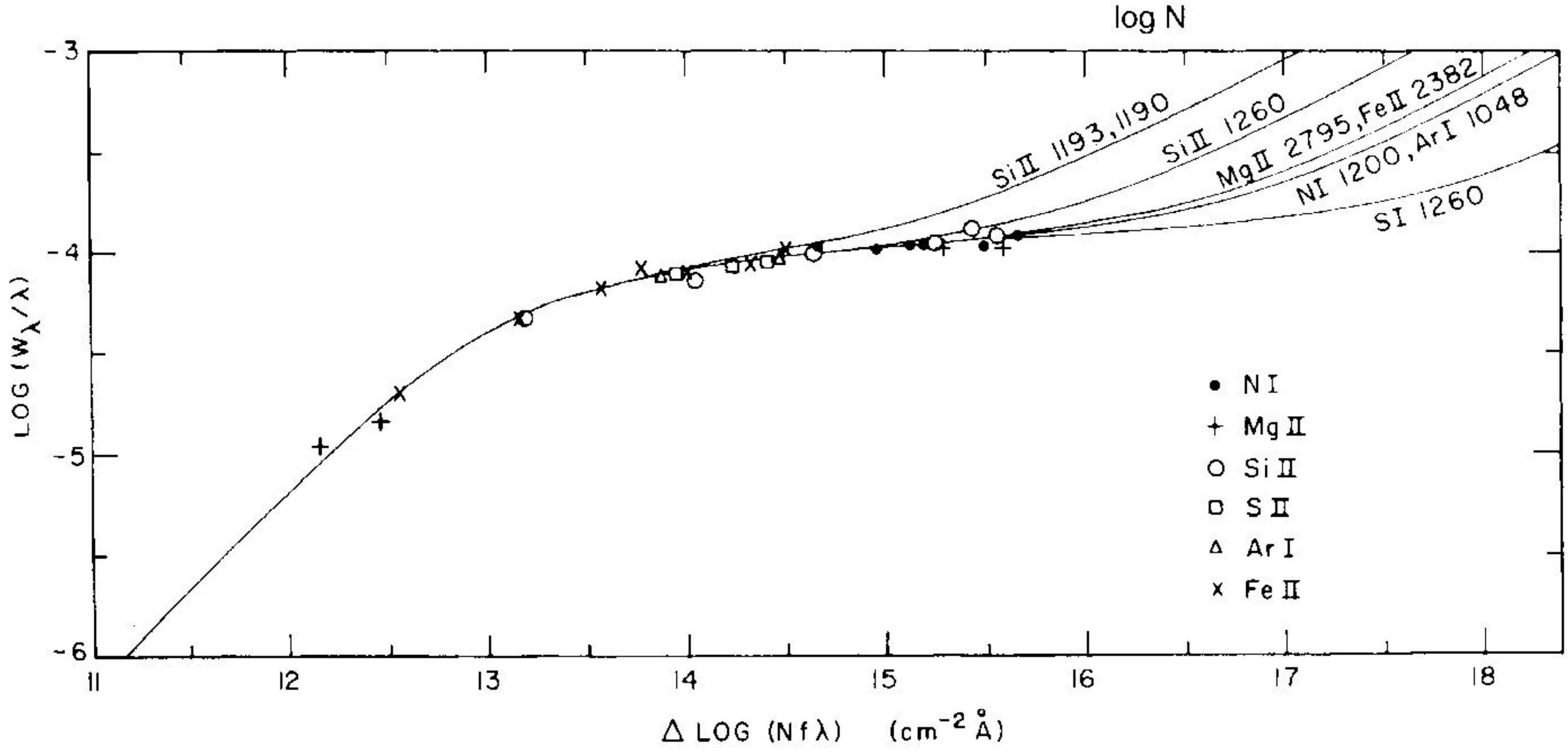
Neutral gas



The splitting in the damping regime of the curve of growth results from different lifetimes of transitions in different atomic species

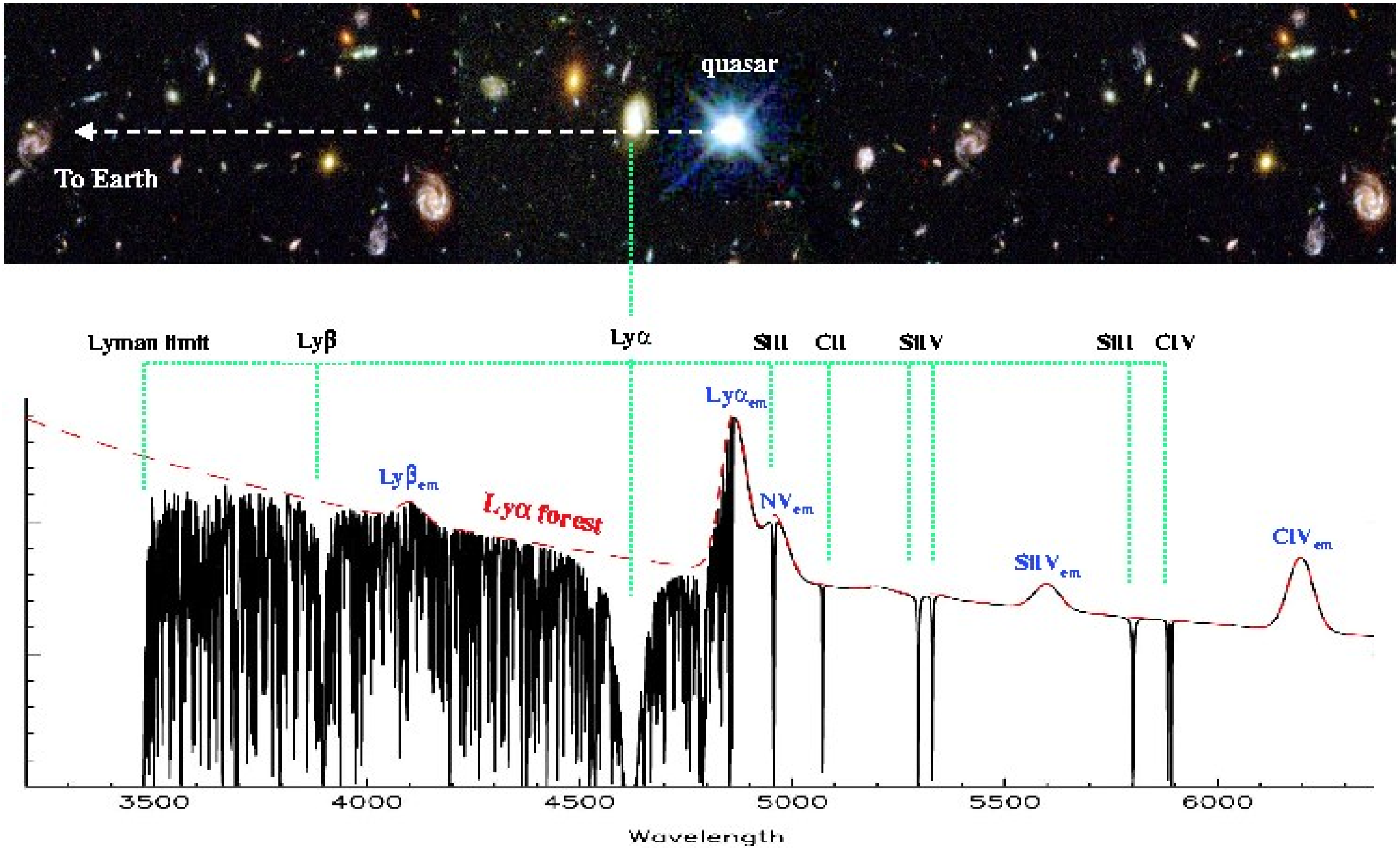
Neutral gas

observed curve of growth, which splits in the damping regime, where the atomic properties (transition probability) take over



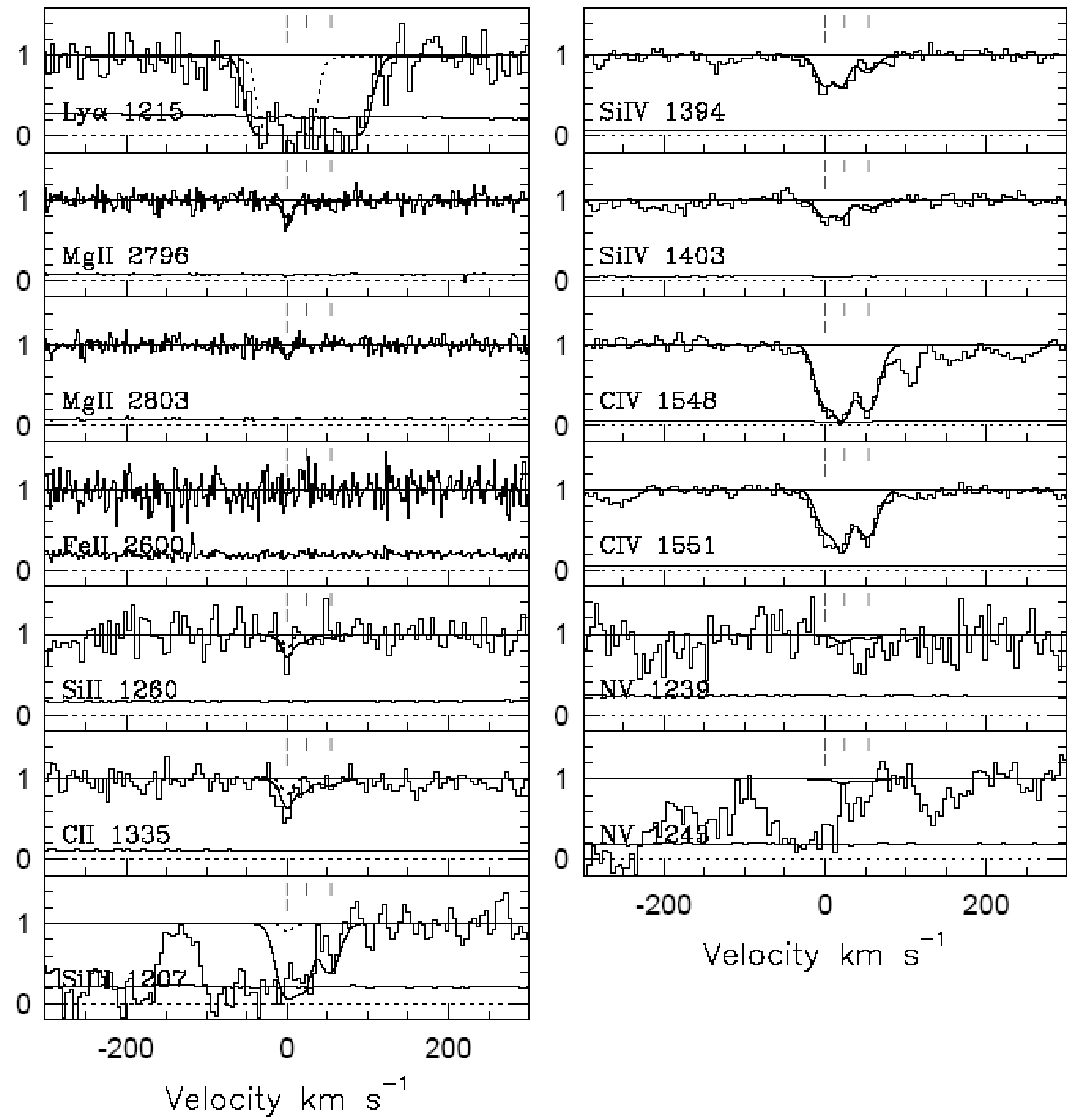
Neutral gas

Lyman α forest, with a deep absorption line, which is on the verge of being a "Damped Lyman α (DAL) system"



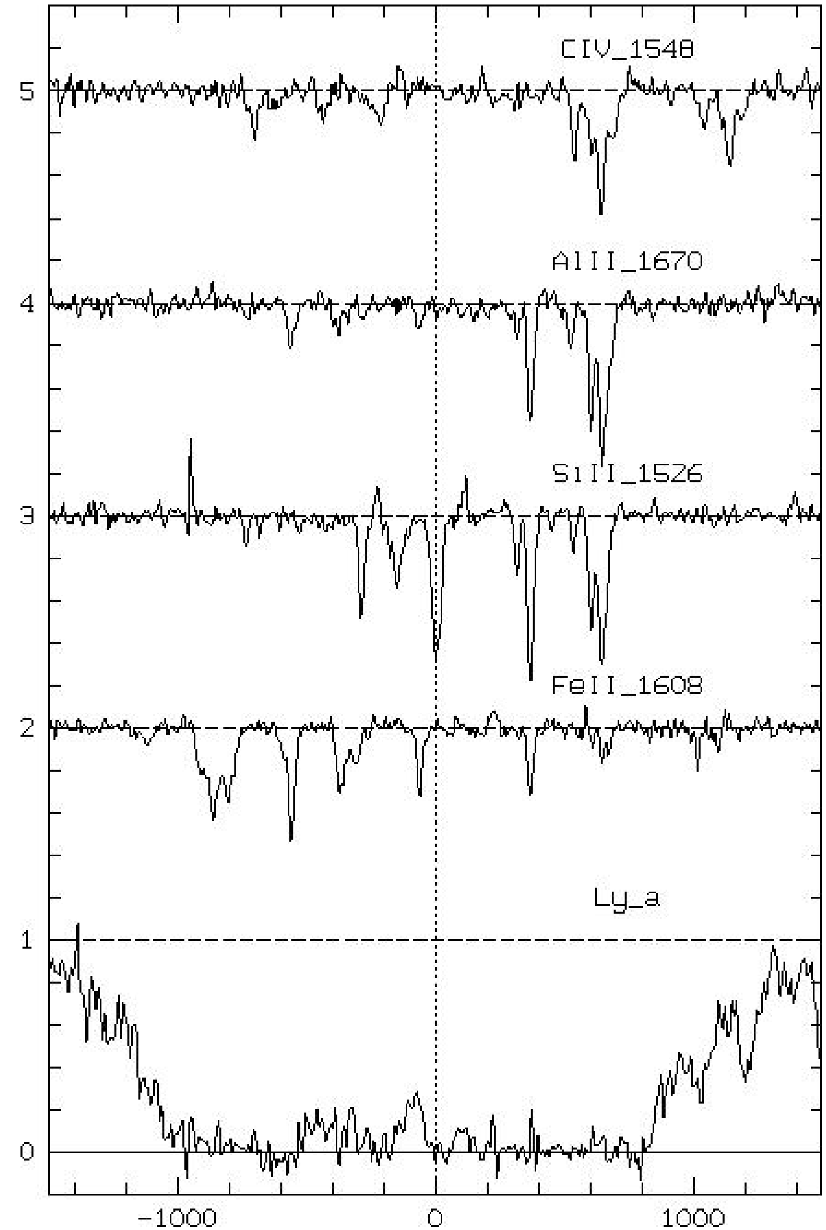
Neutral gas

"DLA system, with a series of absorption lines of haevy elements



Neutral gas

DLA system with a very damped Ly α system having a very broad absorption line



Neutral gas

Helium abundance (Y) as a function of O and N abundance; the extrapolation to zero Y permits the determination of the cosmological Helium abundance