Light bridge profiles. Two magnetic components

- double-peaked shape of the blue component $\Longrightarrow$ two distinct magnetic components in the resolution element (not completely spatially resolved)
  - **strong** magnetic field (3200 G) - corresponding to the surrounding umbra - inclined by 40° to LOS
  - **weak** magnetic field component (1800 G) inclined by 60° to LOS
- asymmetry of the profile $\Longrightarrow$ velocity shift between them: the weak field component red-shifted by 1.1 km/s relative to the strong-field component

Light bridge profiles. Fe 15648.5 $\AA$ Stokes I

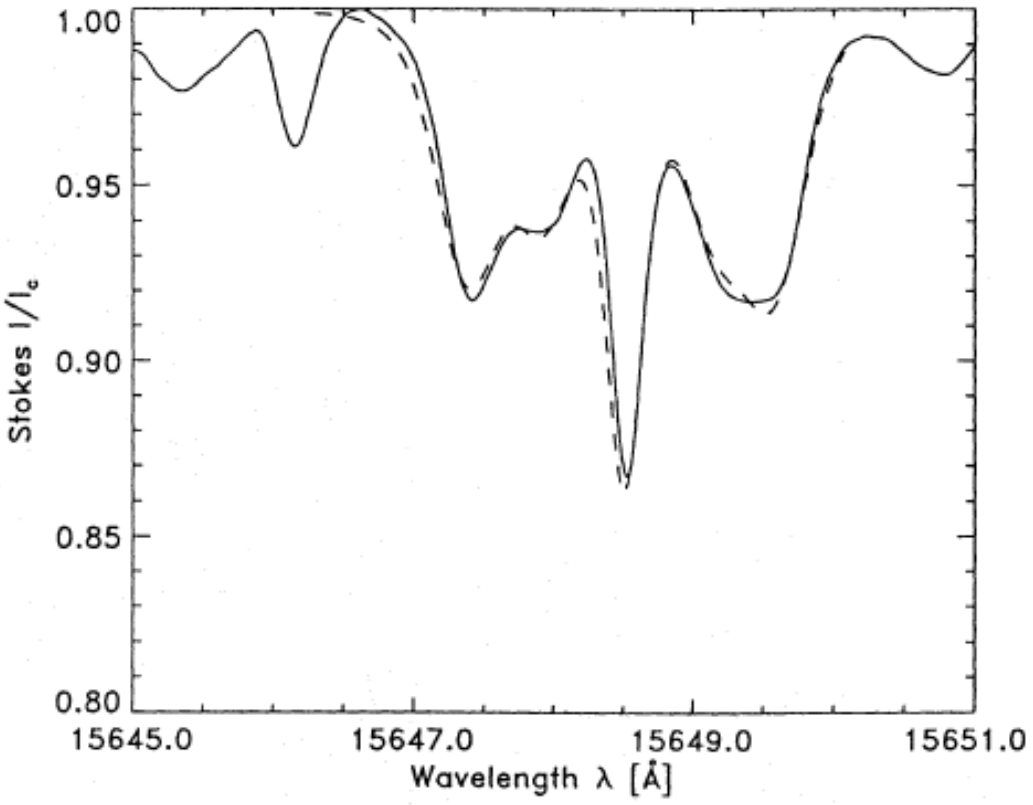


Figure 1: Stokes I profile of FeI 15648.5 $\AA$ observed in the light bridge (solid curve) and the fit using a model composed by two magnetic components (dashed line)

Light bridge profiles. Fitting the two components

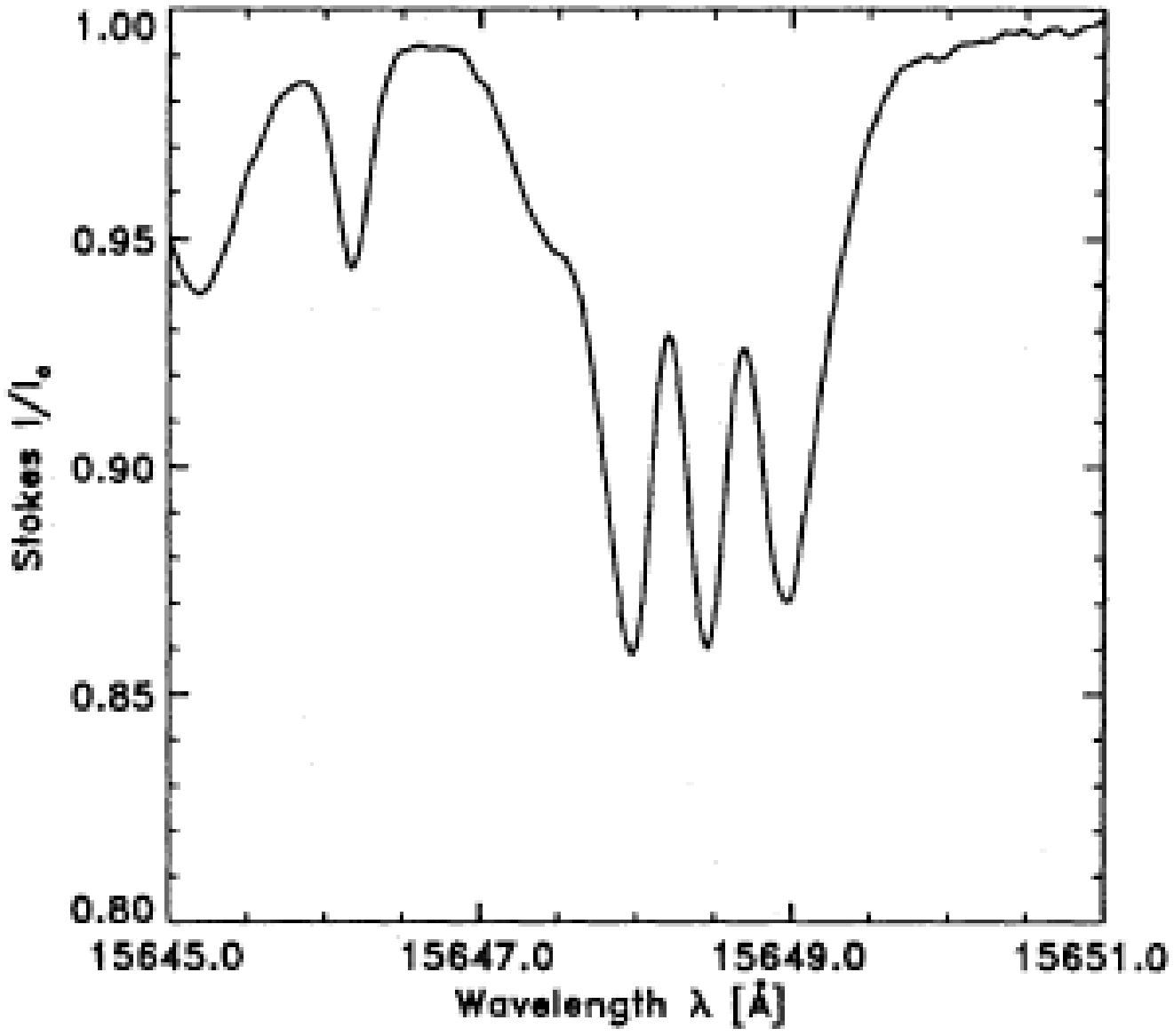
- the final synthetic profile (dashed line from the Figure) is compounded by 45% weak + 55% strong **if they have the same continuum intensity**
- taking into account the different continuum intensity: 30% weak + 70% strong
- all four light-bridge profiles required a combination of this kind in order to fit the data:
  - strong field component between 2900 and 3200 G, inclined by 40° to LOS, contribution 65-70%
  - the weak field component between 1800 and 1900 G, inclined by an angle between 60° and 70° to LOS, contribution 30-35%
- two out of four cases present a shift between the two components: the weak field red-shifted against the strong field, and the maximum shift observed: 1.5 km/s

Blend at 15648.5 $\mathring{A}$.

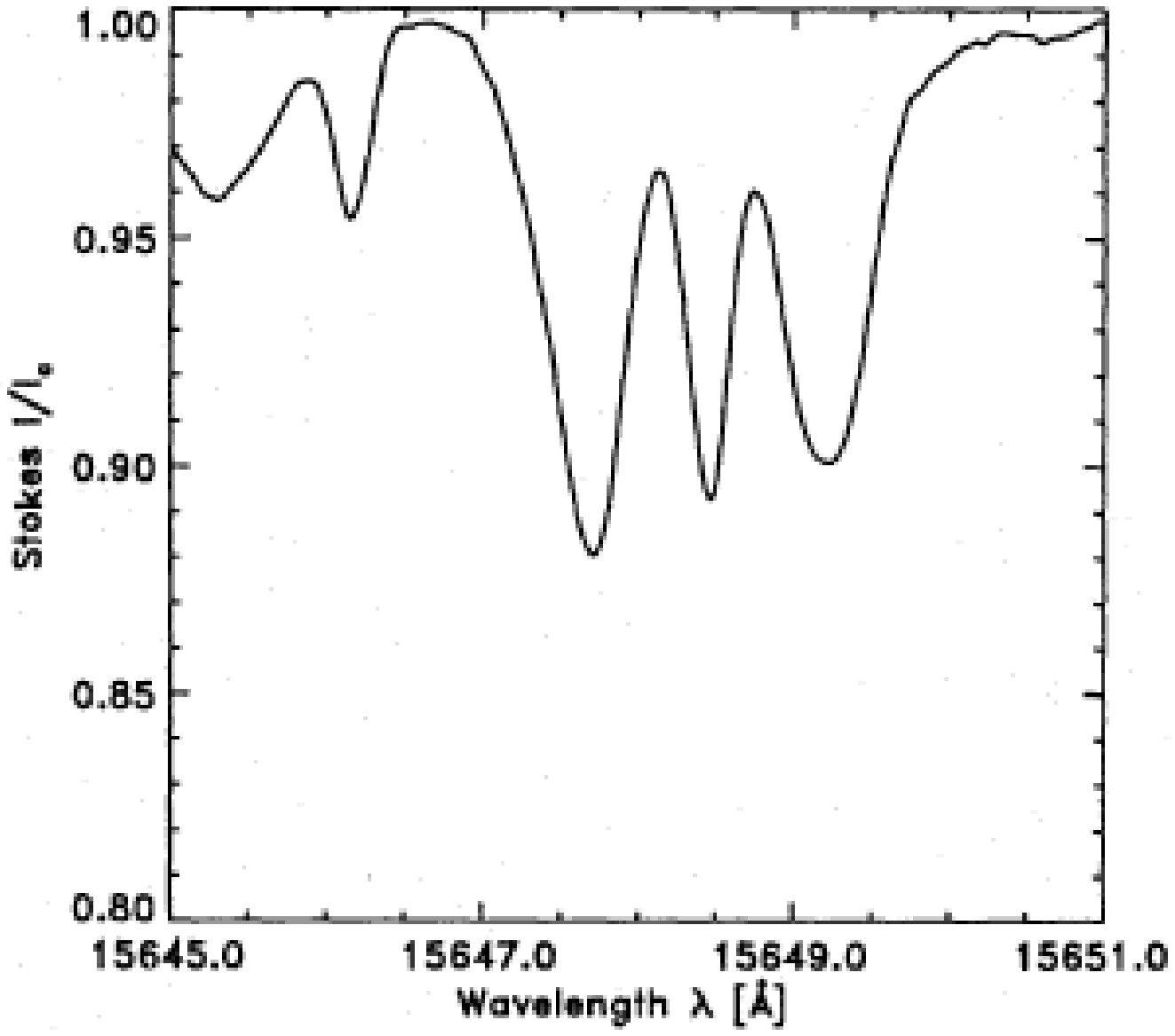
- **Blue component**: a shoulder (blend from another iron line at 15647.4 $\mathring{A}$) which matches exactly on the blue component for a magnetic field B = 3200 G. This means that for fields B $\lessapprox$ 3200 G, the asymmetry increases with the magnetic field.
- **Red component**: weaker blend (located closer to the π component) responsible for the width of the component.

- The blends are only slightly Zeeman sensitive $\Longrightarrow$ a much smaller effect on **Stokes V** profile.
- For smaller filling factor or more stray light the effects of the blends on **Stokes I** are larger, because the σ components are weaker in this case. Only asymmetries (in Stokes I profile) for a high filling factor should be interpreted in terms of velocity gradients.

Blend at 15648.5 $\mathring{A}$. B = 1600 G



Blend at 15648.5 $\mathring{A}$. B = 2380 G



Blend at 15648.5 $\mathring{A}$. B = 3040 G