INDEXES

j: grid point index

p: pixel index

l: line index

MODIFIERS

$\vec{q}$: sequence

$\tilde{q}$: model approximation

$\hat{q}$: continuous value

SYMBOLS

θ: stellar properties

S: PHOENIX spectrum

$\vec{G}$: PHOENIX grid

$\vec{\phi}$: Flux vector

$\vec{\lambda}$: Wavelength axis

μ: Line center

A: Line amplitude

σ: Gaussian line width

γ: Lorentzian line width

M: Manifold model

Φ: Model flux vector

$$\theta = \left[T_{eff}, \log\left(g\right), \left[\mathrm{Fe/H}\right]\right]$$

$$\theta_j \mapsto S_j$$

$$S_j = \begin{bmatrix} \vec{\phi}_j \coloneqq \left(\phi_{jp}\right)_{p=1}^{P} \\ \\ \vec{\lambda} \coloneqq \left(\lambda_p\right)_{p=1}^{P} \end{bmatrix}$$

$$\vec{G} = \left(S_j\right)_{j=1}^{J}$$

$$\vec{\phi}_j \mapsto \left(\begin{bmatrix} \mu_l & A_{jl} & \sigma_{jl} & \gamma_{jl} \end{bmatrix}\right)_{l=1}^{L}$$

$$M_l : \vec{\rho} \to \begin{bmatrix} \vec{A}_l & \vec{\sigma}_l & \vec{\gamma}_l \end{bmatrix} \coloneqq \left(\begin{bmatrix} A_{jl} & \sigma_{jl} & \gamma_{jl} \end{bmatrix}\right)_{j=1}^{J}$$

$$\tilde{M}_l \approx M_l$$

$$\tilde{M}_l : \vec{\theta} \to \begin{bmatrix} \vec{\tilde{A}}_l & \vec{\tilde{\sigma}}_l & \vec{\tilde{\gamma}}_l \end{bmatrix}$$

$$\vec{\tilde{M}} = \left(\tilde{M}_l\right)_{l=1}^{L}$$

$$\vec{\tilde{M}}(\hat{\theta}) = \left(\begin{bmatrix} \hat{A}_l & \hat{\sigma}_l & \hat{\gamma}_l \end{bmatrix}\right)_{l=1}^{L}$$

$$\left[\left(\mu_l\right)_{l=1}^{L} \mid \vec{\tilde{M}}(\hat{\theta})\right] \mapsto \vec{\Phi}$$