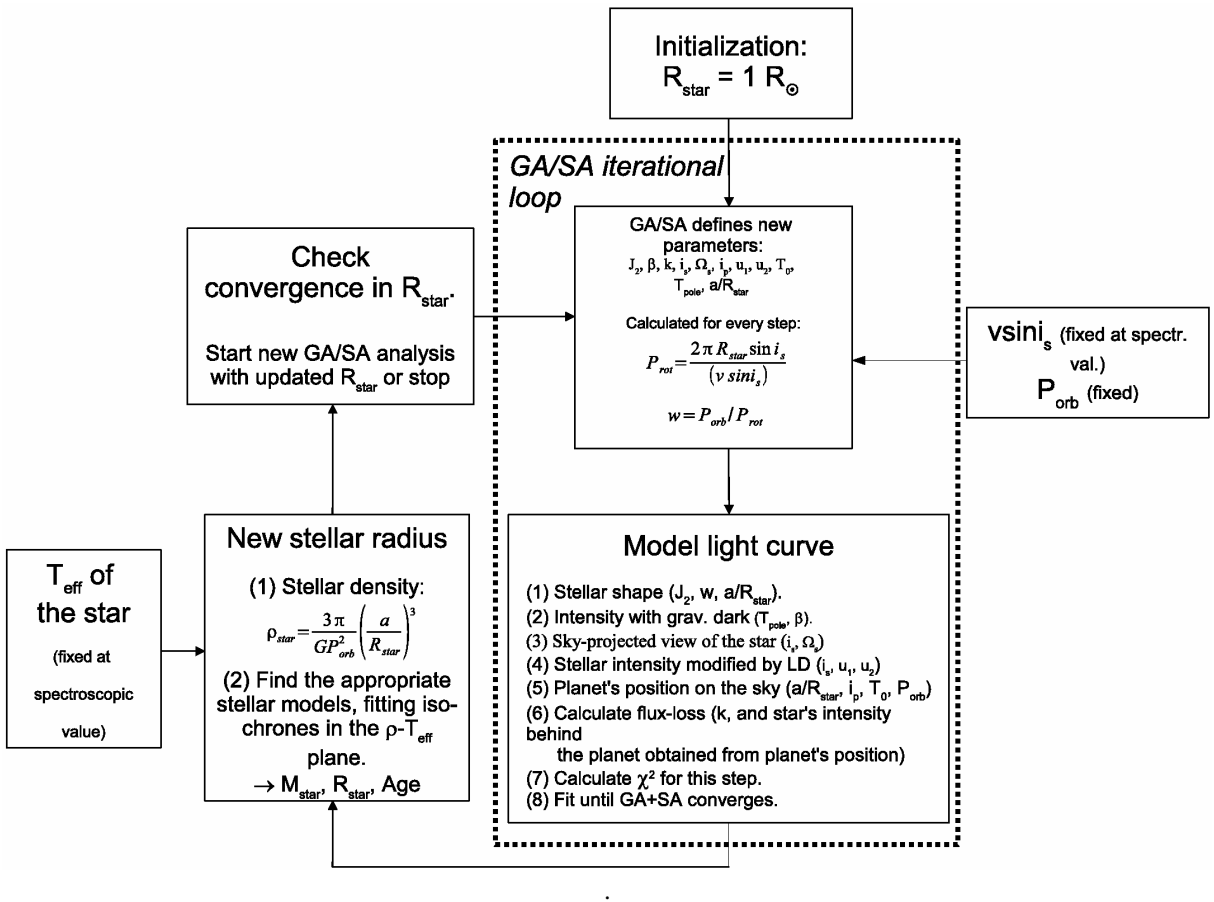
Initialization:
R_{star} = 1 $R_\odot$
GA/SA iterational loop
GA/SA defines new parameters:
J_2, β, k, i_s, Ω_s, i_p, u_1, u_2, T_0, T_{pole}, a/R_{star}
Calculated for every step:
$P_{rot} = \frac{2\pi R_{star} \sin i_s}{(v \, sini_s)}$
$w = P_{orb}/P_{rot}$
vsini$_s$ (fixed at spectr. val.)
P_{orb} (fixed)
Check convergence in R_{star}.
Start new GA/SA analysis with updated R_{star} or stop
Model light curve
(1) Stellar shape (J_2, w, a/R_{star}).
(2) Intensity with grav. dark (T_{pole}, β).
(3) Sky-projected view of the star (i_s, Ω_s)
(4) Stellar intensity modified by LD (i_s, u_1, u_2)
(5) Planet's position on the sky (a/R_{star}, i_p, T_0, P_{orb})
(6) Calculate flux-loss (k, and star's intensity behind the planet obtained from planet's position)
(7) Calculate χ^2 for this step.
(8) Fit until GA+SA converges.
New stellar radius
(1) Stellar density:
$\rho_{star} = \frac{3\pi}{GP_{orb}^2}\left(\frac{a}{R_{star}}\right)^3$
(2) Find the appropriate stellar models, fitting iso-chrones in the ρ-T_{eff} plane.
→ M_{star}, R_{star}, Age
T_{eff} of the star
(fixed at spectroscopic value)