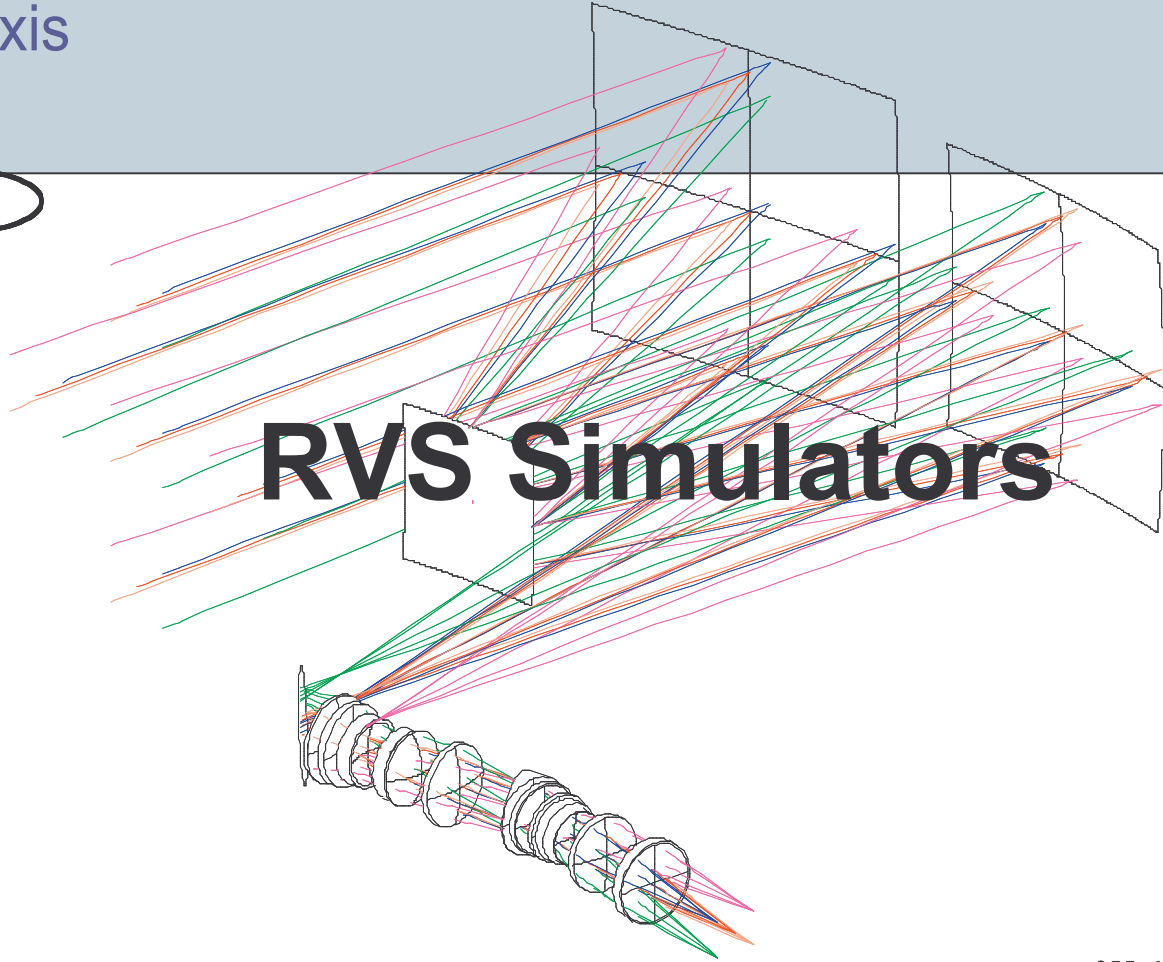
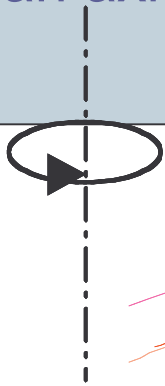


Scan axis



RVS Simulators

255.10 MM

Along scan disp. - Horizontal telescope

Scale: 0.10

AsF 11-Mar-02

Simulators: development & motivation

- First version : Single / simple spectrum
 - First order assessment of the performances
 - Numerous computations (e.g. many spectral types)
 - Definition/test of the analysis algorithms
- Second version : Single spectrum (optical/detector effects)
 - Optimisation of the design
 - Assessment of the detailed accuracy budget
- Third version : RVS field of view (Galaxy model)
 - Impact of the crowding
 - Galactic and time dependant effect (latter stage)
- Integration into the GAIA simulator

First simulator overview

Kurucz high resolution spectrum
($R = 250\,000$)



Simulator V1.0
gaia_simu_V1



N realisation of an RVS like spectra
Resolution / sampling / entrance pupil ...

Simulation of the RVS spectra

- Effects taken into account
 - Convolution by a Gaussian profile (Resolution)
 - Conversion from energy density to photon counts
 - Normalisation according to the magnitude (**C. Jordi**)
 - Wavelength shift according to the radial velocity
 - Sampling
 - 1D to 2D transformation (simple transverse profile)
 - Generate the noises (photon, RoN, zodiacal light)
 - 2D to 1D : row summation
 - CCD & transit summation

Install and run

- Download from <http://wwwhip.obspm.fr>: gzipped tar file
 - Flux normalisation table (**C. Jordi**)
 - Code in C
- Compile and link the sources with a makefile
- Run the program
 - Define the input parameters in “parameters.dat”
 - Run: `gaia_simu_V1 parameters.dat`

Parameters.dat (1)

simulation_spectrum_number

simulation_output_file

yes or no

file_name_star_photon_count

file_name_spectrum_input

file_name_spectrum_output

star_effective_temperature

star_surface_gravity

star_metallicity

star_kinematic_population

star_radial_velocity

star_magnitude

star_photon_count

Parameters.dat (2)

zodiacal_magnitude

zodiacal_photon_count_V0

zodiacal_photon_count

transit_nb

CCD_nb

pupil_area

overall_efficiency

exposure_time_per_CCD

wave_beginning

wave_end

resolution_input_spectrum

resolution_gaia

sampling

spectrum_width

profile_across_scan []

pixel_angular_area

readout_noise

Future developments

- Possibility to read any input spectrum
- ...

Please provide specifications

GDAAS

Radial Velocity Spectrometer:

- Radial velocity source detection
(April 2004 – developer support needed)
- Wavelength calibration
(April 2004 – developer support needed)
- Radial velocity cross-correlation (July 2003)