G 3

# Circumsubstellar disks' SED in dependence of substellar parameters and system inclination

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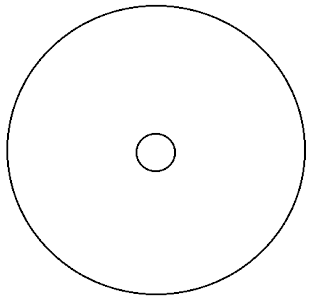
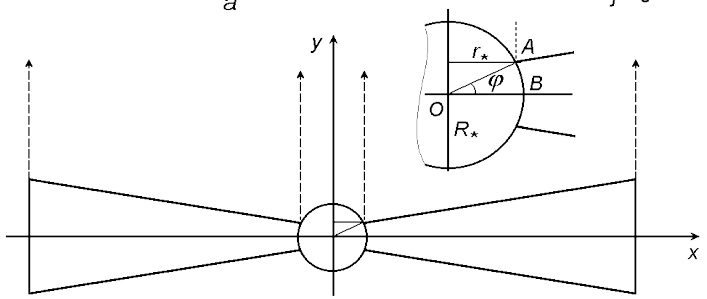
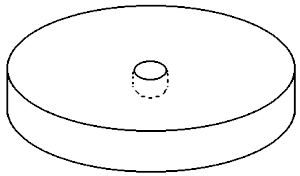


а

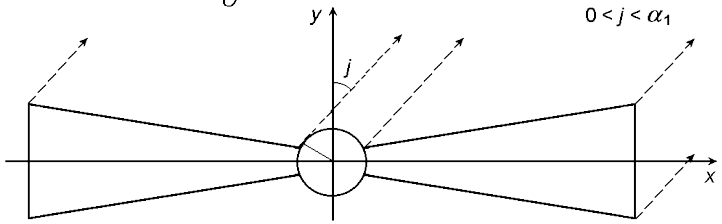
$j = 0$

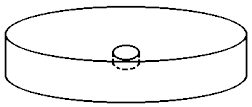


б

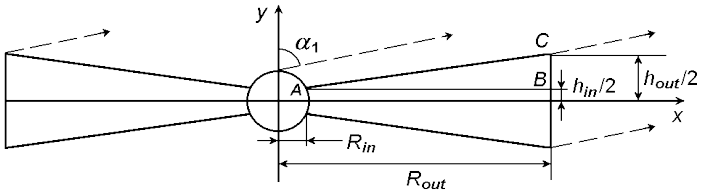
$0 < j < \alpha_1$



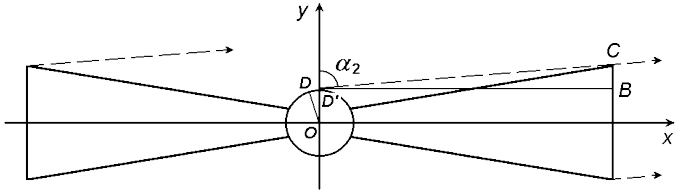
в

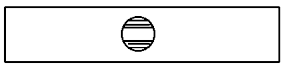
$j = \alpha_1$




г

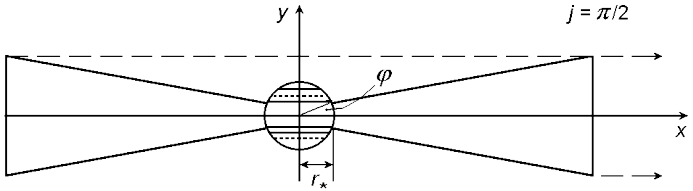
$j = \alpha_2$

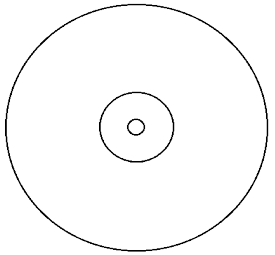


д

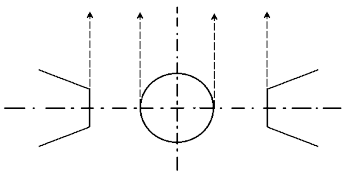
$j = \pi/2$



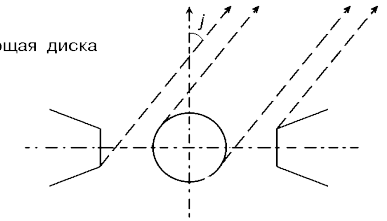
а

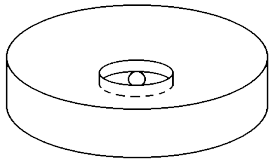
$j = 0$




б

$0 < j < \beta$



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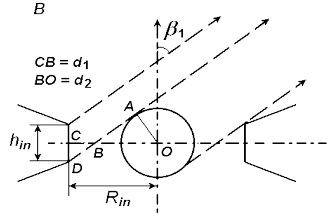


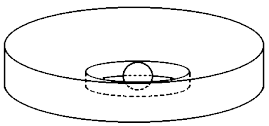

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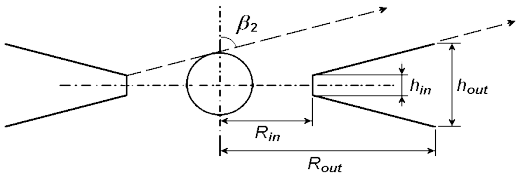


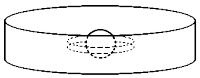

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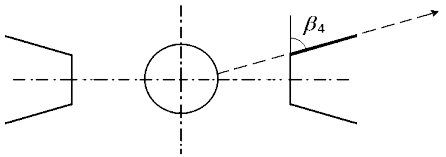


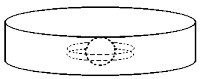

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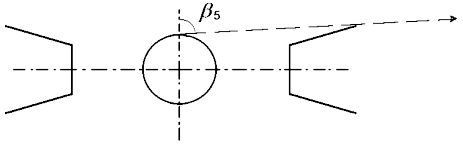

An atlas of 1120 SEDs for systems with very different parameters was created:

- substellar masses within the range of 0.01-0.08 $M_{sun}$;
- protoplanetary disks with different inclination (0º - 80º);
- systems' ages are 1-30 Myr;
- substars and protoplanetary disks irradiate as black body;
- distance from Sun to substar equals to 10 pc;
- disk's inner radius equals to central object radius and sublimation radius at the age of 1Myr.

# $F\,(M_{ss})$

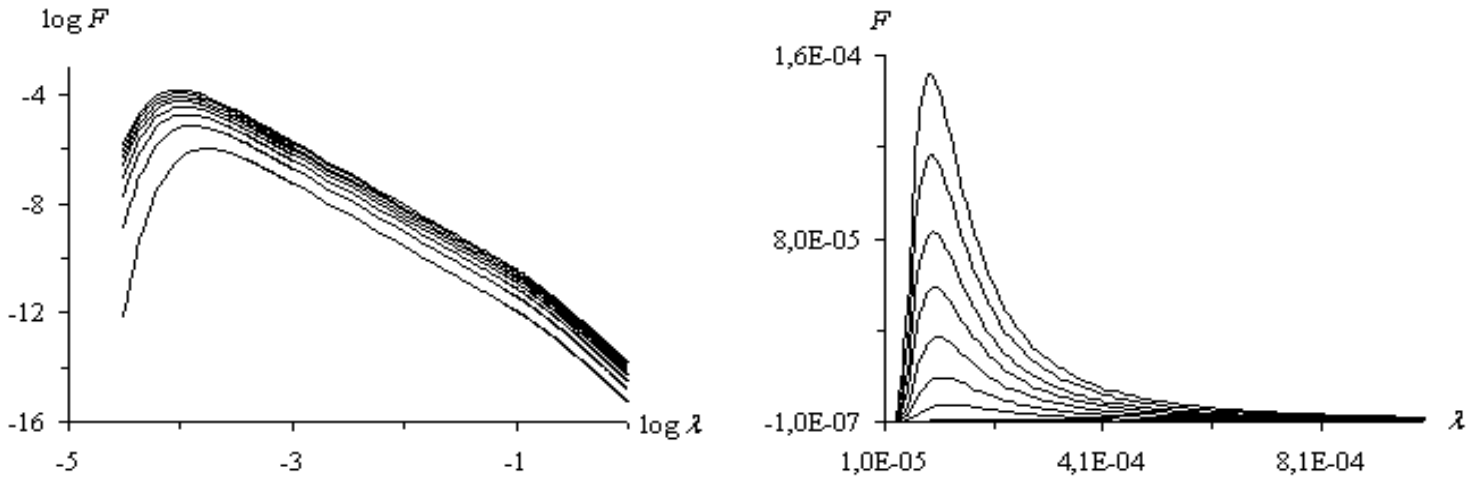


Fig.1. SEDs for substars with disks without inner holes that are located face on and have an age equals to 1 Myr. Different lines correspond to different substellar masses (form top to bottom): 0.08 – 0.01 $M_{sun}$ with step 0.01 $M_{sun}$. $F$ is the radiant flux, erg/(cm$^2$·s·cm), $\lambda$ is the wavelength, μm.

# $F(t)$

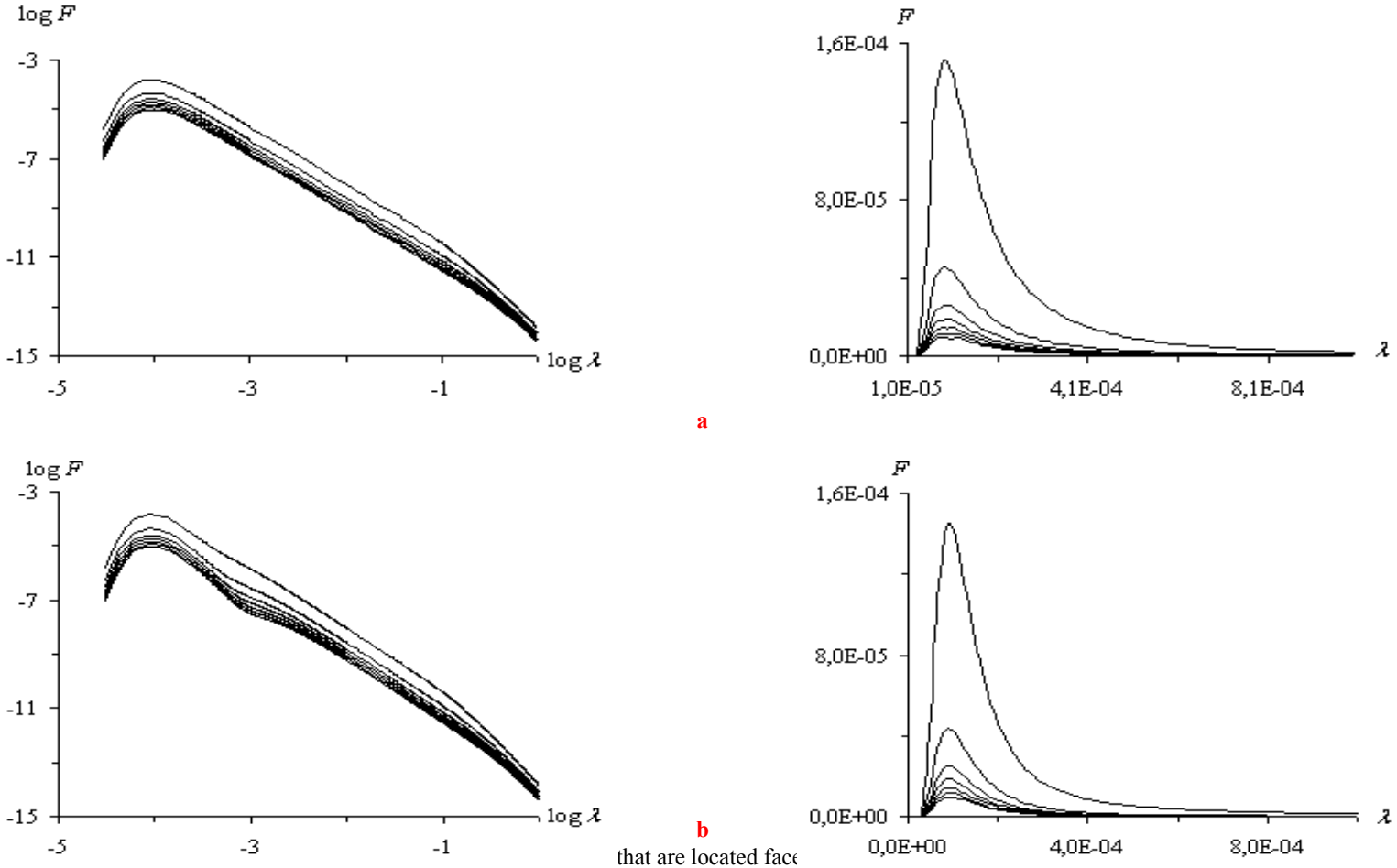


Fig.2. S that are located face d to different systems ages (form top to bottom): 1-30 Myr with step 5 Myr. *F* is the radiant flux, erg/(cm²·s·cm), λ is the wavelength, μm.

# $F(j)$

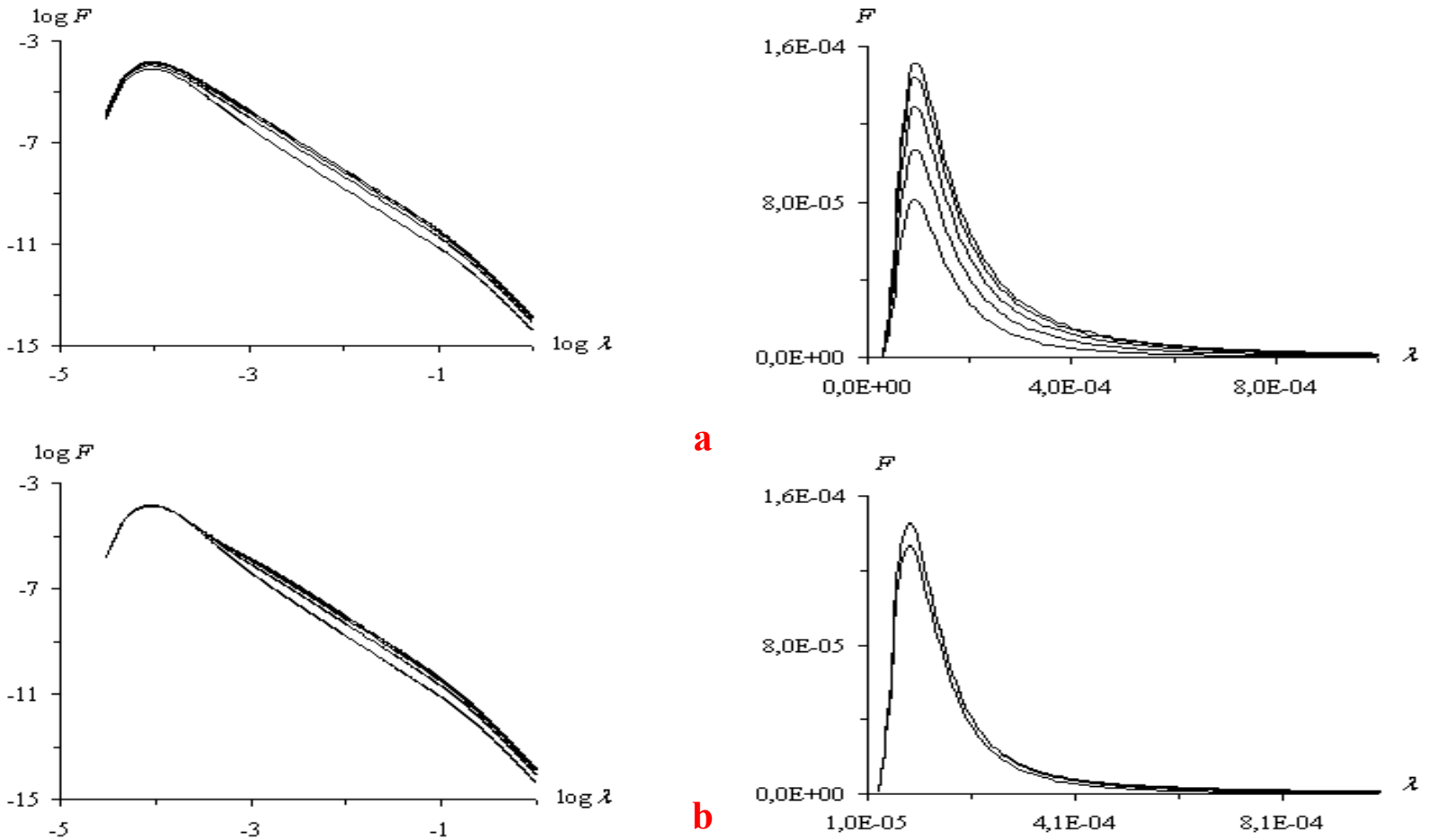


Fig.3. SEDs for substars with disks without inner holes (a) and with it (b), with substellar mass equals to 0.08 $M_{sun}$ and age 1 Myr. Different lines correspond to different systems inclinations (form top to bottom): 0° – 80° with step 20° . $F$ is the radiant flux, erg/(cm$^2$·s·cm), $\lambda$ is the wavelength, μm.

# $F(j)$

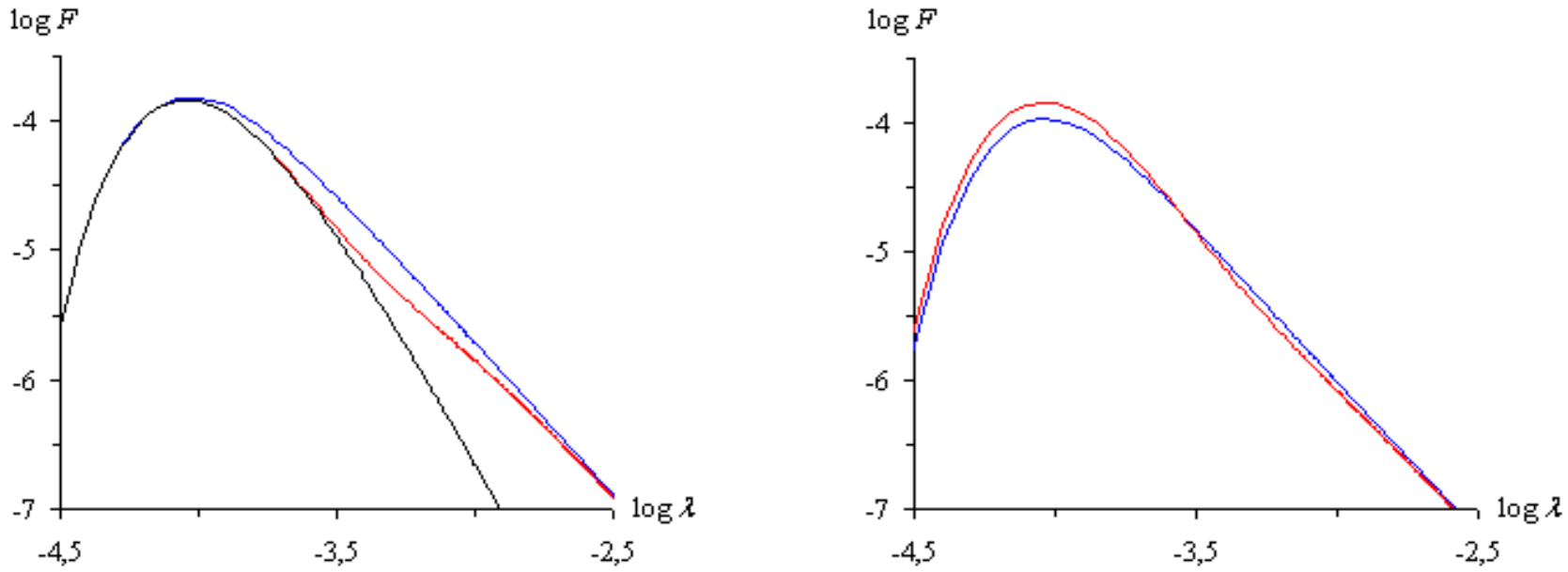


Fig.4. SEDs for the systems that contain substar with mass 0.01 $M_{sun}$ and age 1 Myr. On each panel are shown – SED for gapless disk, – SED for disk with inner hole and – substellar back body irradiation. On a left panel are shown SEDs for systems that are located face on (0°), and on right panel systems that are inclined on 60°. $F$ is the radiant flux, erg/(cm$^2$·s·cm), $\lambda$ is the wavelength, μm.

# Conclusions

The SEDs' shape of Brown Dwarf with protoplanetary disk strongly depends on the age and inclination of the system. The mass of a central object affects mostly its' intensity.

With studying a SEDs it is possible to determine:

- at first the mass of central object and then
  - ✓ presence of the disk with or without inner hole of the system,
  - ✓ approximate age of the system (that permits not taking into account an idea of simultaneous star formation in a cluster),
  - ✓ system inclination.