Ionized winds driven away from black holes
(SPEX/PION exercise)
(Continued 2)

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Explore the PION absorption model

The model is:

$$\texttt{hot} \times \texttt{reds} \times \texttt{pion1} \times \texttt{pion2} \times (mbb + pow) \tag{1}$$

The first case: I do not set:

```
SPEX > com rel 5 1,2
```

The second case: I set this command. This document considers **the first case**.

Starting with a reasonable guess, fit the spectrum with the model set up as Eq. 1. Write a discussion section on the suitable order of the two pion components.

```
bash > cat 5-6-1.com
data inst_amo1 bhiw_amo1
plot device xs

dist 0.01158 z
comp reds
comp hot
comp pow
com mbb
com pion
com pion
log exe 5-6-1fit6

com rel 3:4 6,5,1,2
cal
pl ty data
pl ux ang
pl uy fang
pl
```

First, I set `xil` of `pion1` to be 1, and set `xil` of `pion2` to be 2.7. The final fitting result is shown in Fig. 1. But I think it is uncorrect. The definition of `xil` is:

$$\xi = \frac{L}{nr^2} \tag{2}$$

L is the source luminosity, n is the hydrogen densisy, and r is the distance from the ionizing source. I think the order of `pion1` and `pion2` should be changed, and the result is shown in Fig. 2. The fitting result indicates that the latter fitting is better than the former fitting.

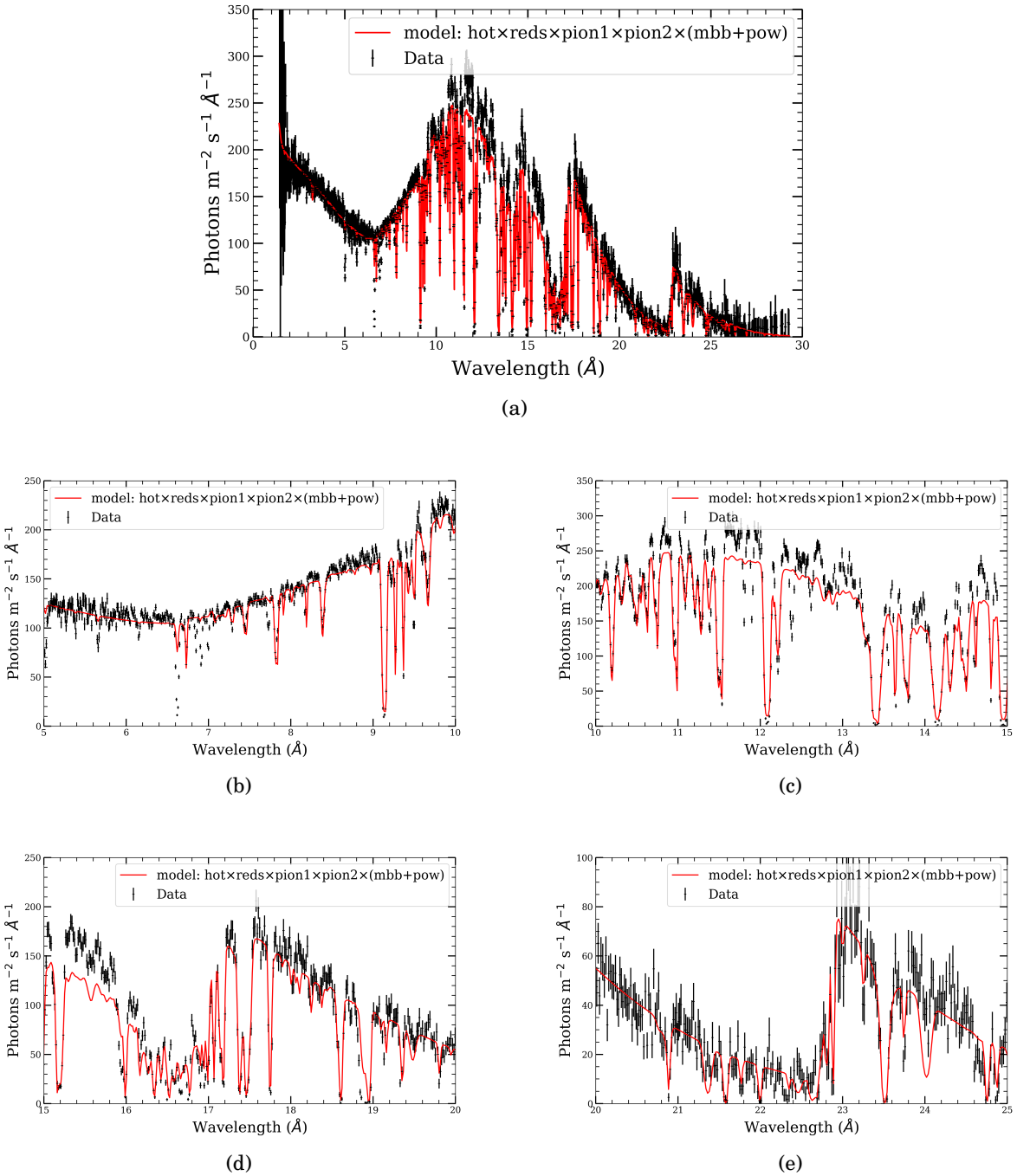

Figure 1: The wavelength-flux figure.

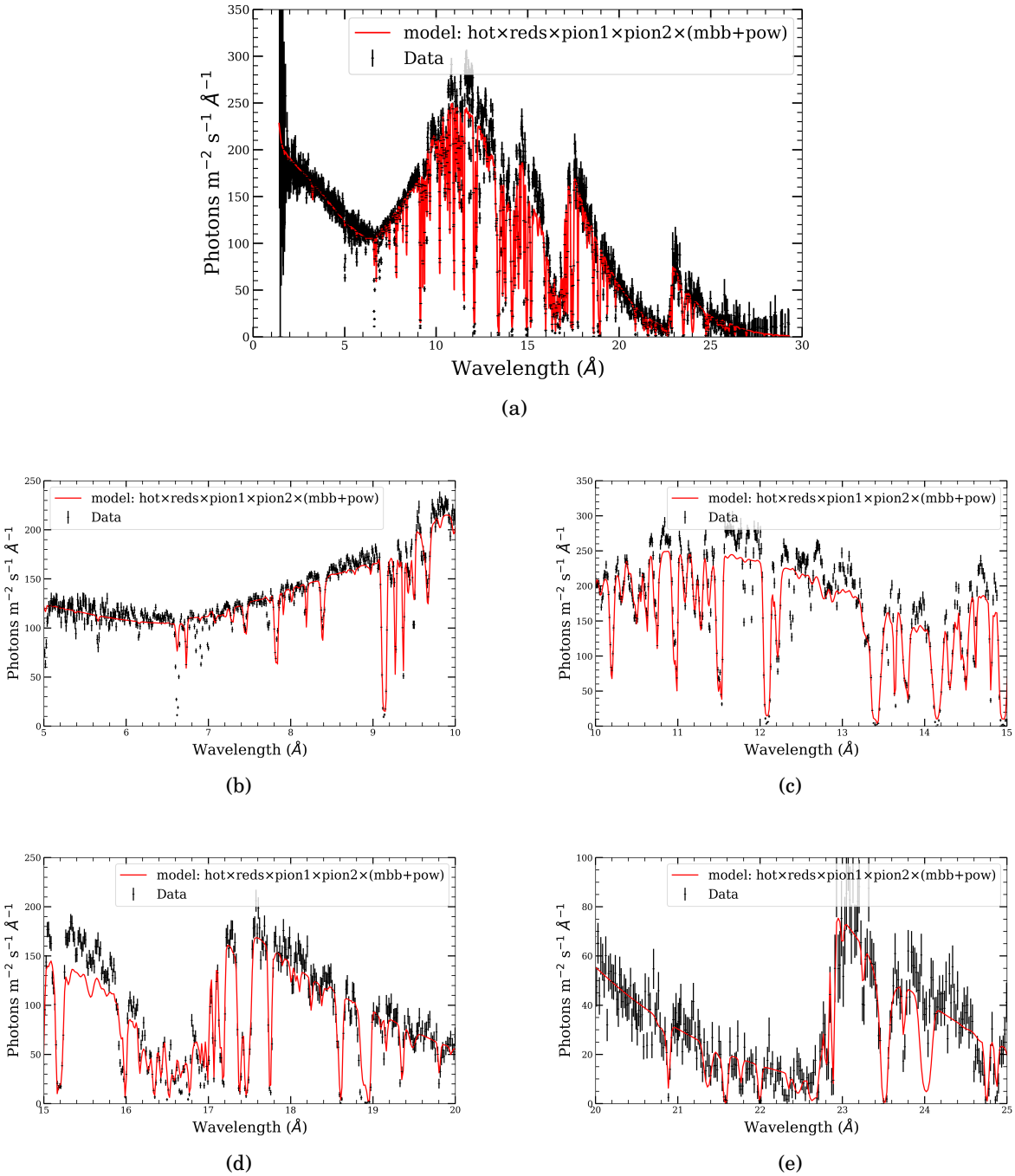

Figure 2: The wavelength-flux figure.