PHY2506
Atmospheric Data Assimilation
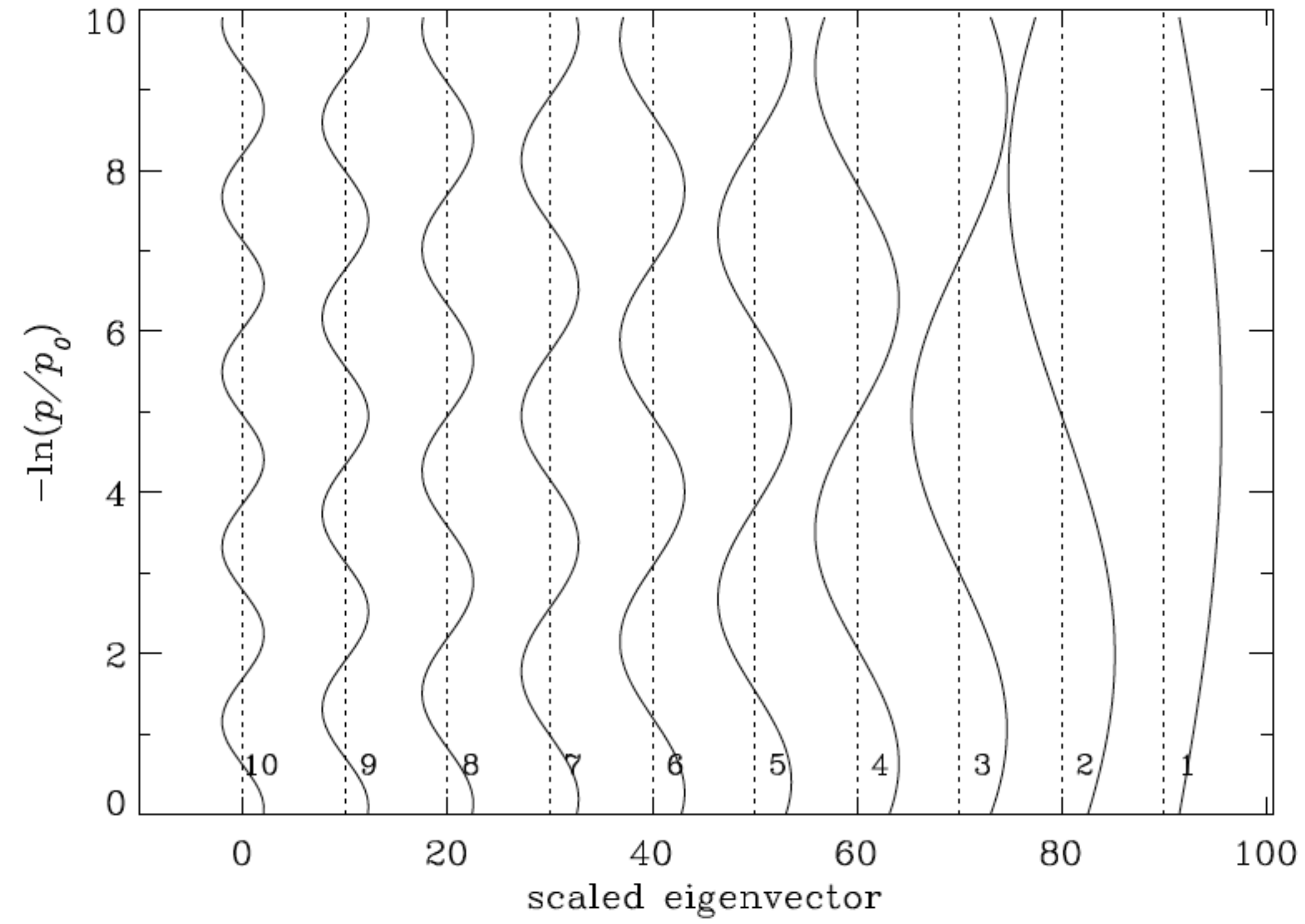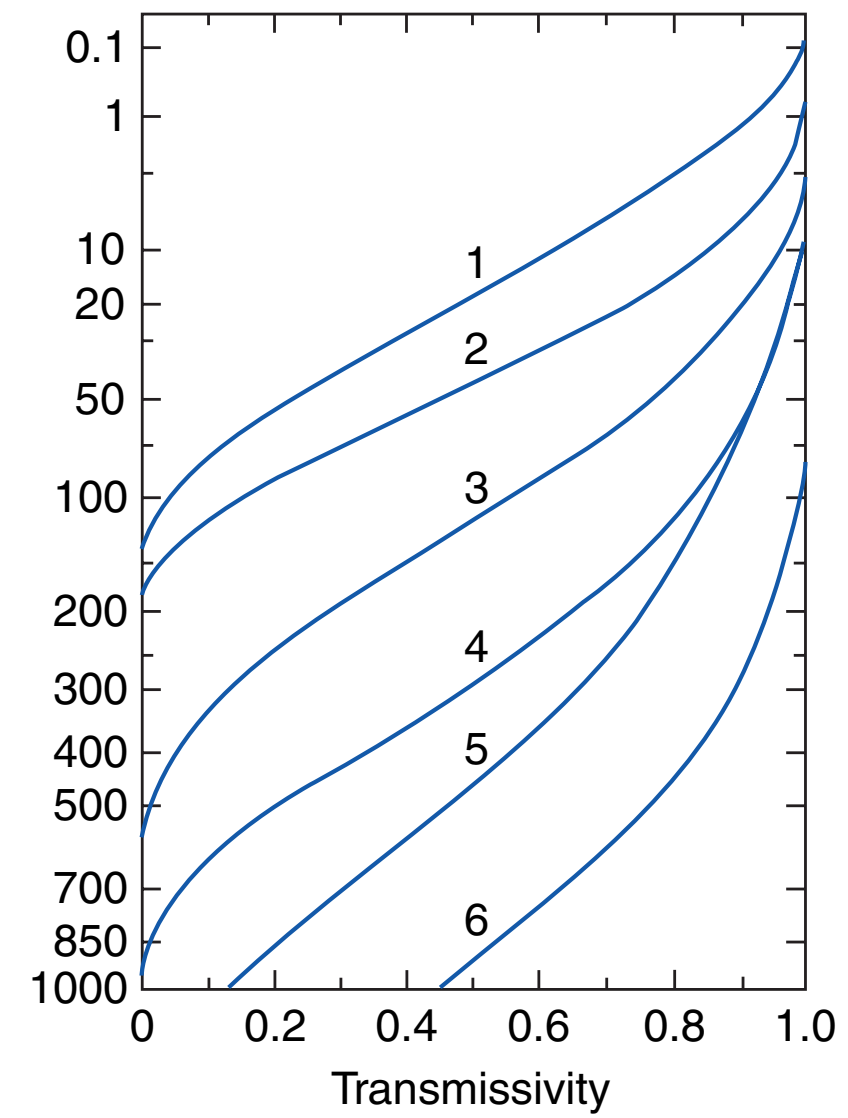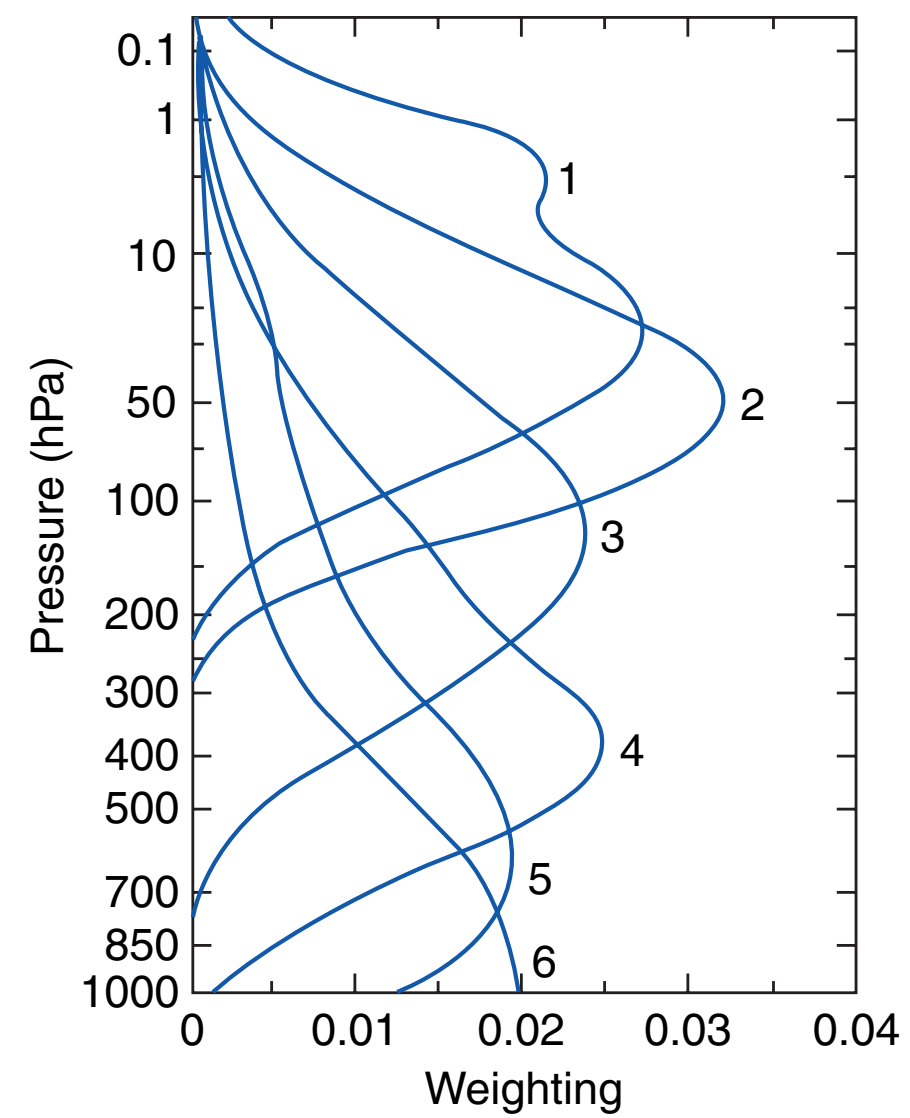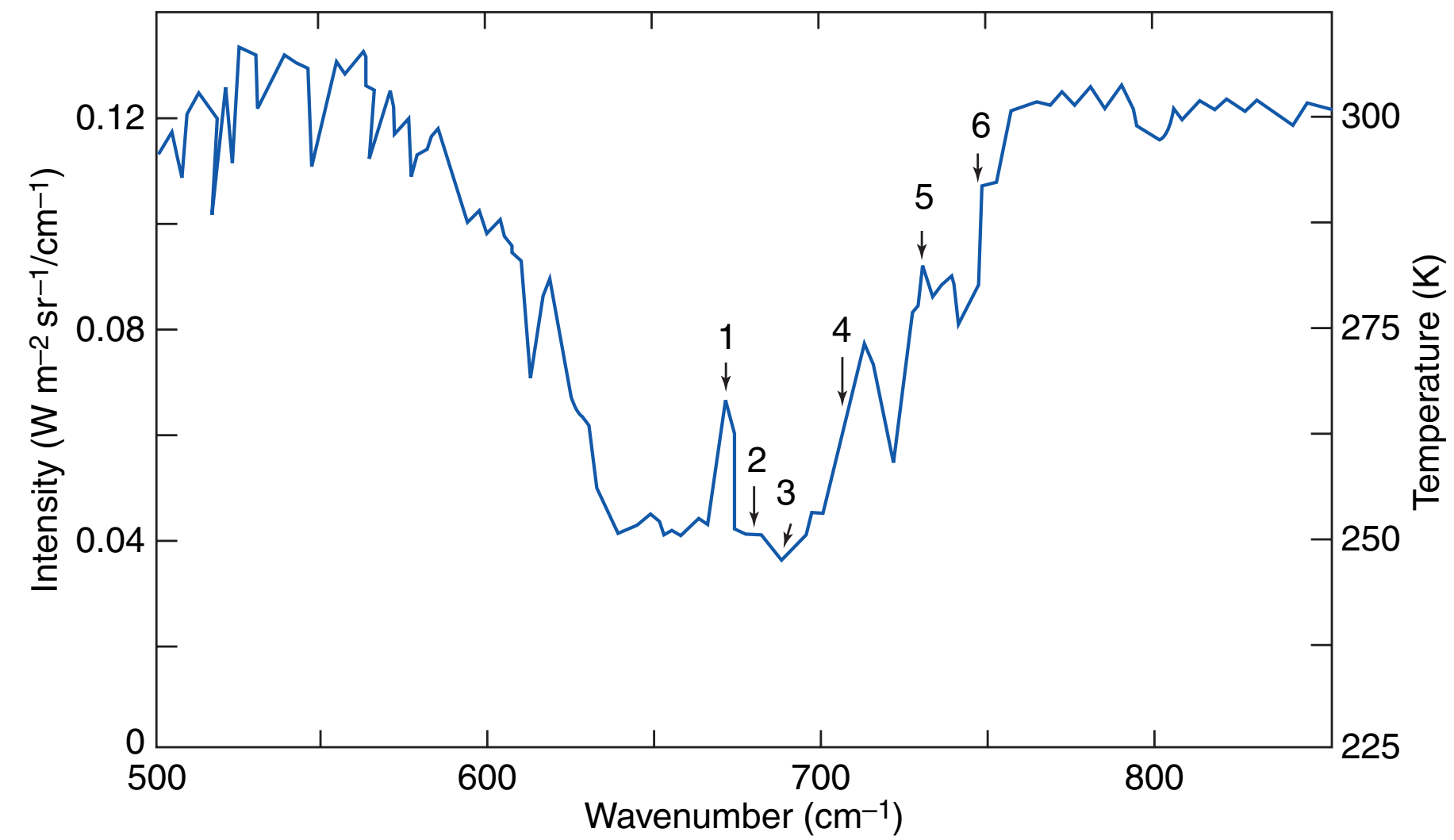
Lecture 8

Supplementary Slides

Fig. 3.2 The most significant ten error patterns of the *a priori* covariance matrix $S_{ij} = \sigma_a^2 \exp(-|i-j|\delta z/h)$, for $\sigma_a \simeq 3\,\mathrm{K}$ and $h = 1$

[Rodgers, 2000]

15 µm CO₂ Absorption Band

[Wallace and Hobbs, 2006]

Table 5.1   The nonlinearity parameter for the ten largest error patterns in the standard example.

Pattern	Nonlinearity	Pattern	Nonlinearity
1	0.4435	6	0.0186
2	0.1555	7	0.0115
3	0.0838	8	0.0073
4	0.0519	9	0.0048
5	0.0308	10	0.0033

$$c^2 = \delta \mathbf{y}^T \mathbf{S}_\epsilon^{-1} \bar{\delta \mathbf{y}}$$

[Rodgers, 2000]