EOT2

EOT1?

EOT

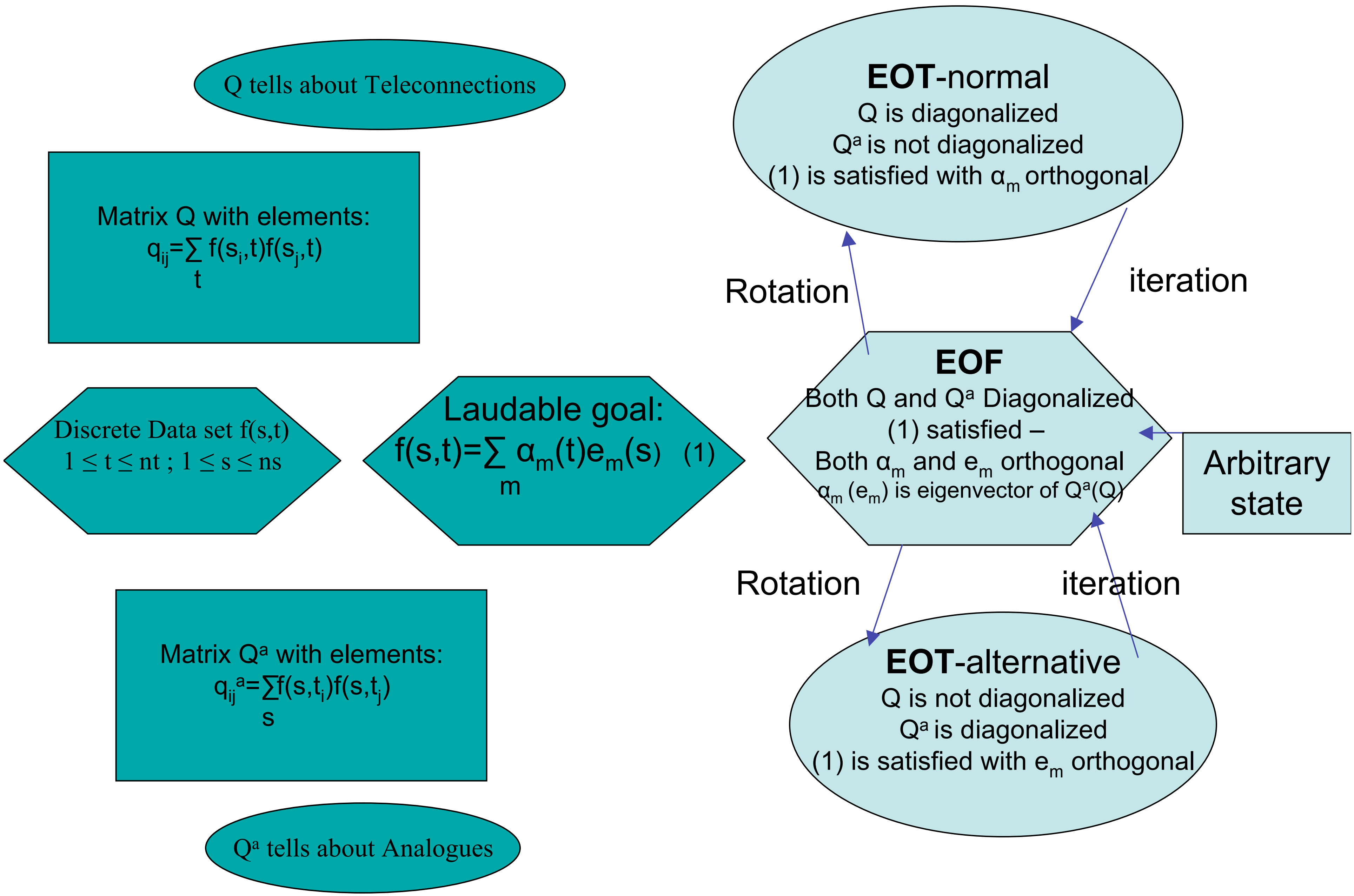

Fig.5.6: Summary of EOT/F procedures.

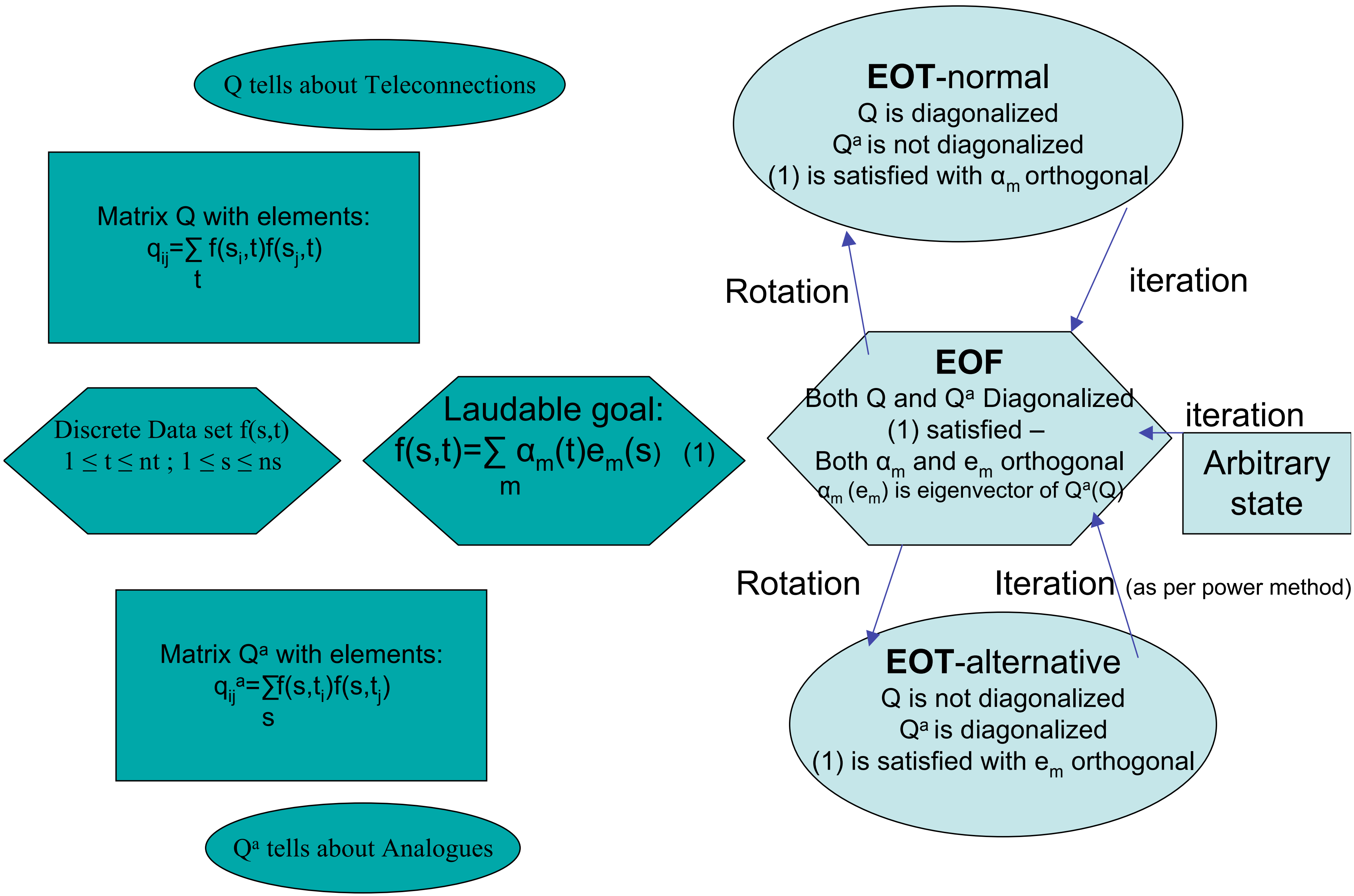

Fig.5.6: Summary of EOT/F procedures.

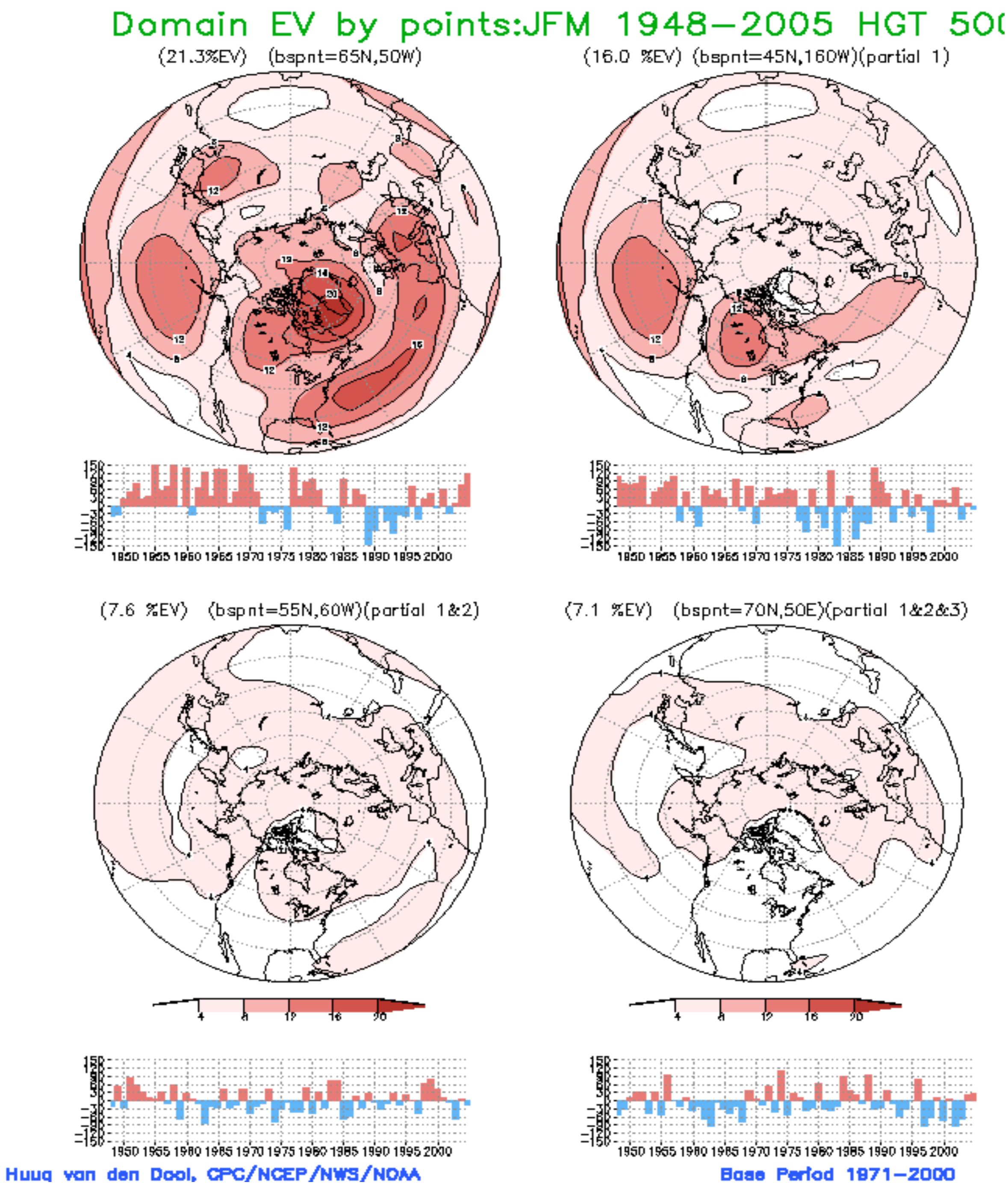

Fig. 4.3 EV(i),the variance explained by single gridpoints in % of the total variance, using equation 4.3. In the upper left for raw data, in the upper right after removal of the first EOT mode, lower left after removal of the first two modes. Contours every 4%. The timeseries shown are the residual height anomaly at the gridpoint that explains the most of the remaining domain integrated variance.

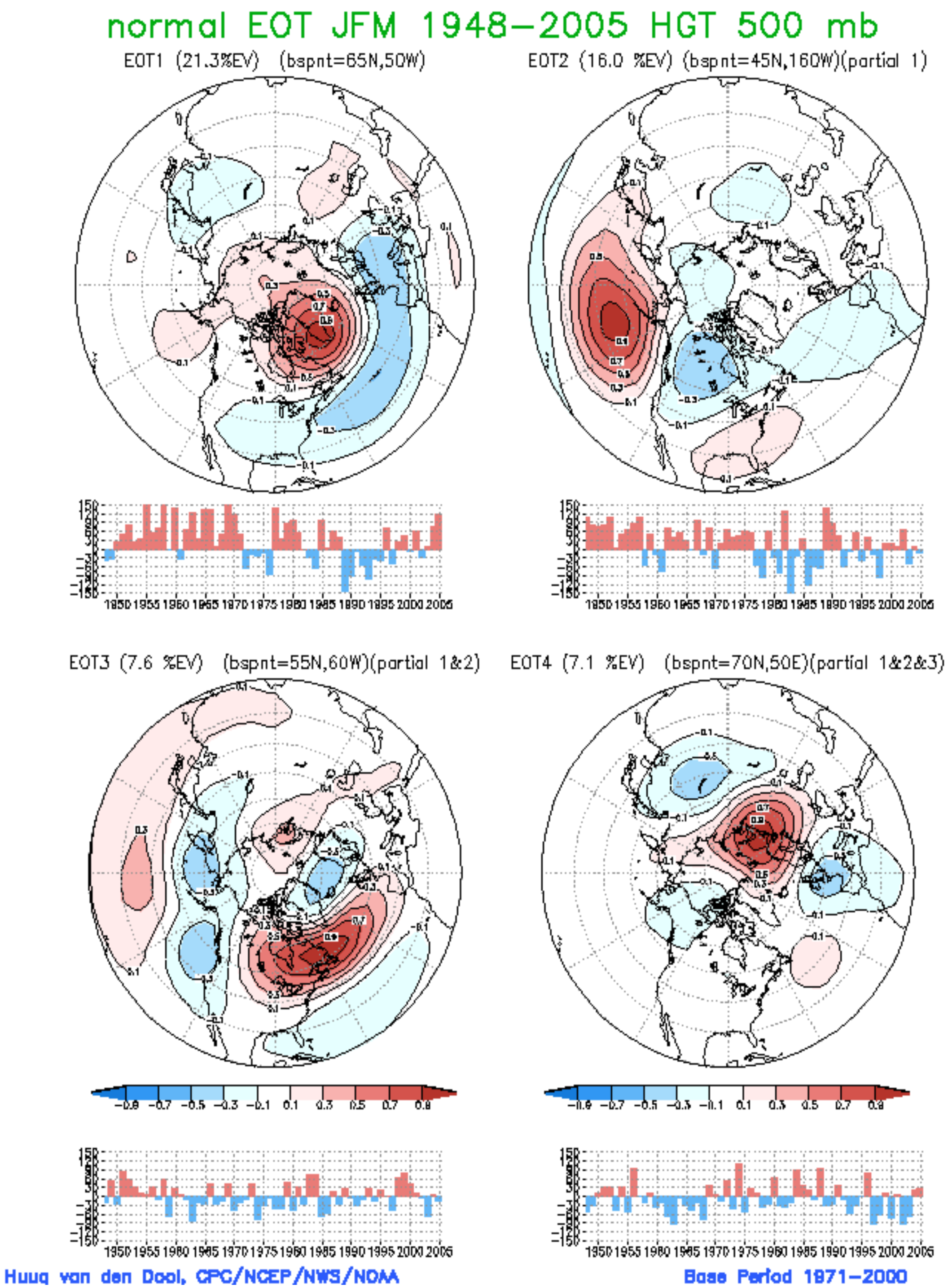

Fig.4.4 Display of four leading EOT for seasonal (JFM) mean 500 mb height. Shown are the regression coefficient between the height at the basepoint and the height at all other gridpoints (maps) and the timeseries of residual 500mb height anomaly (geopotential meters) at the basepoints. In the upper left for raw data, in the upper right after removal of the first EOT mode, lower left after removal of the first two modes. Contours every 0.2, starting contours +/- 0.1. Data source: NCEP Global Reanalysis. Period 1948-2005. Domain 20N-90N

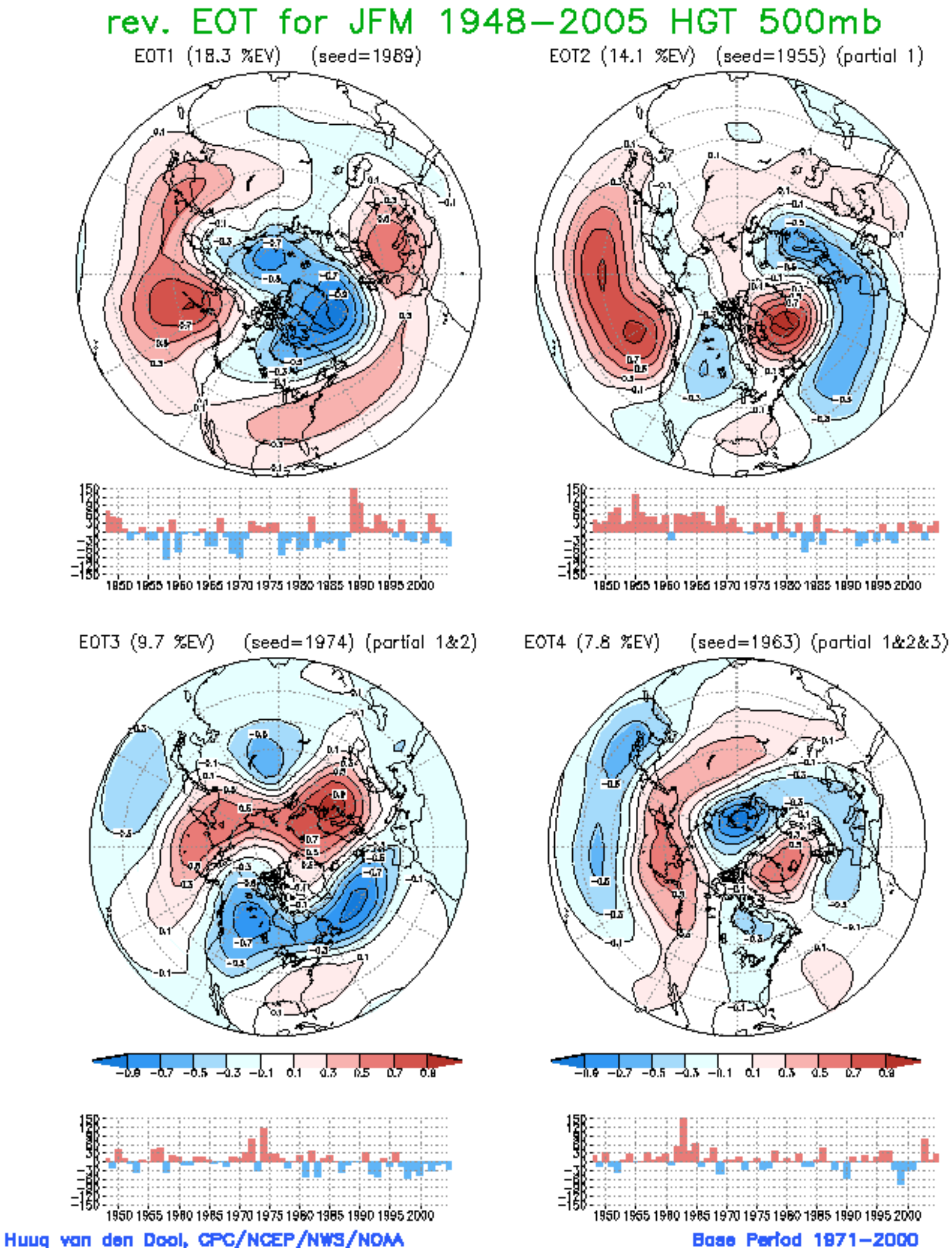

Fig.5.4 Display of four leading alternative EOT for seasonal (JFM) mean 500 mb height. Shown are the regression coefficient between the basepoint in time (1989 etc) and all other years (timeseries) and the maps of 500mb height anomaly (geopotential meters) observed in 1989, 1955 etc . In the upper left for raw data, in the upper right after removal of the first EOT mode, lower left after removal of the first two modes. A postprocessing is applied, see Appendix I, such that the physical units (gpm) are in the time series, and the maps have norm=1. Contours every 0.2, starting contours +/- 0.1. Data source: NCEP Global Reanalysis. Period 1948-2005. Domain 20N-90N

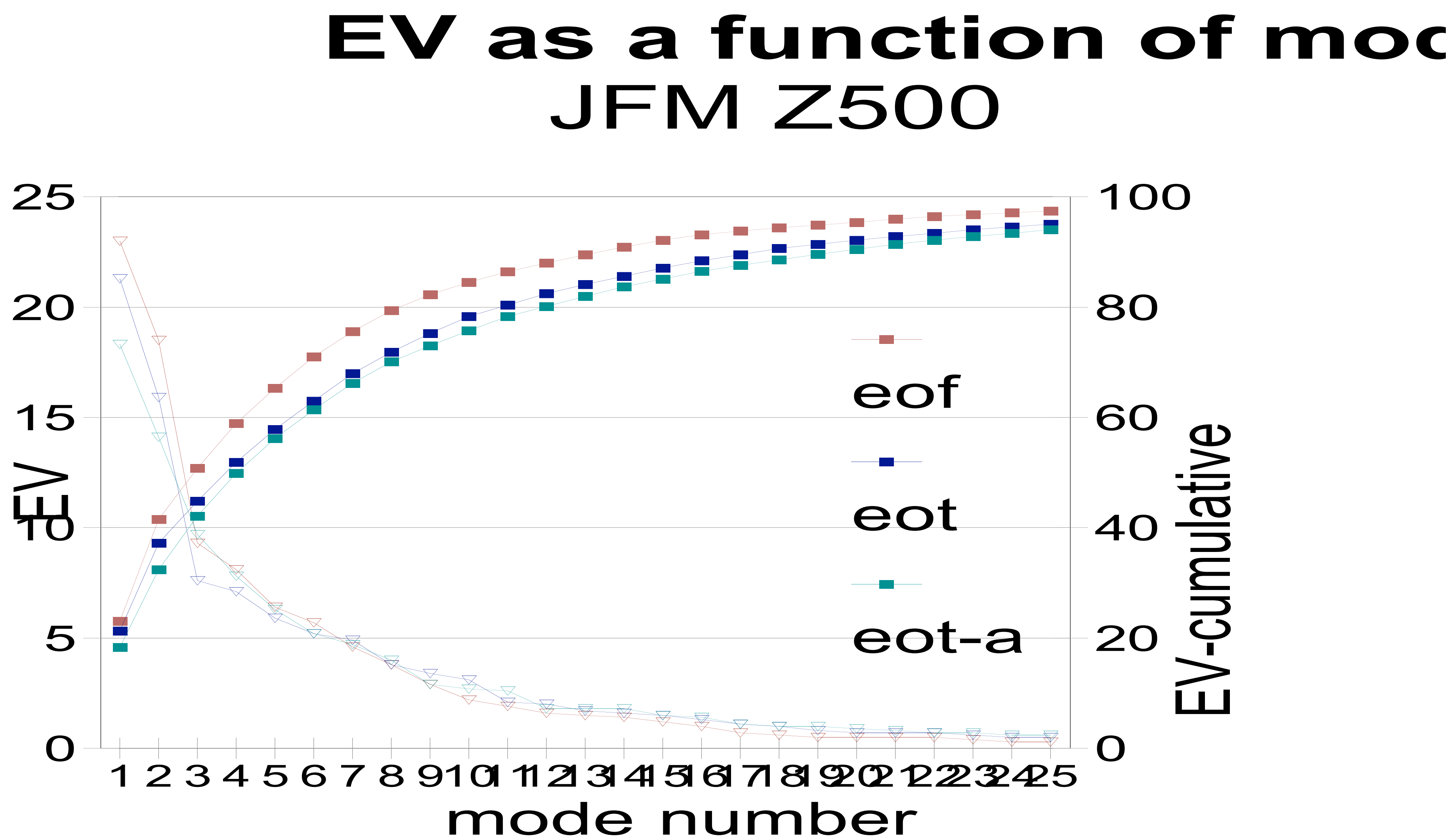

Fig 5.7. Explained Variance (EV) as a function of mode (m=1,25) for seasonal mean (JFM) Z500, 20N-90N, 1948-2005. Shown are both EV(m) (scale on the left, triangles) and cumulative EV(m) (scale on the right, squares). Red lines are for EOF, and blue and green for EOT and alternative EOT respectively.

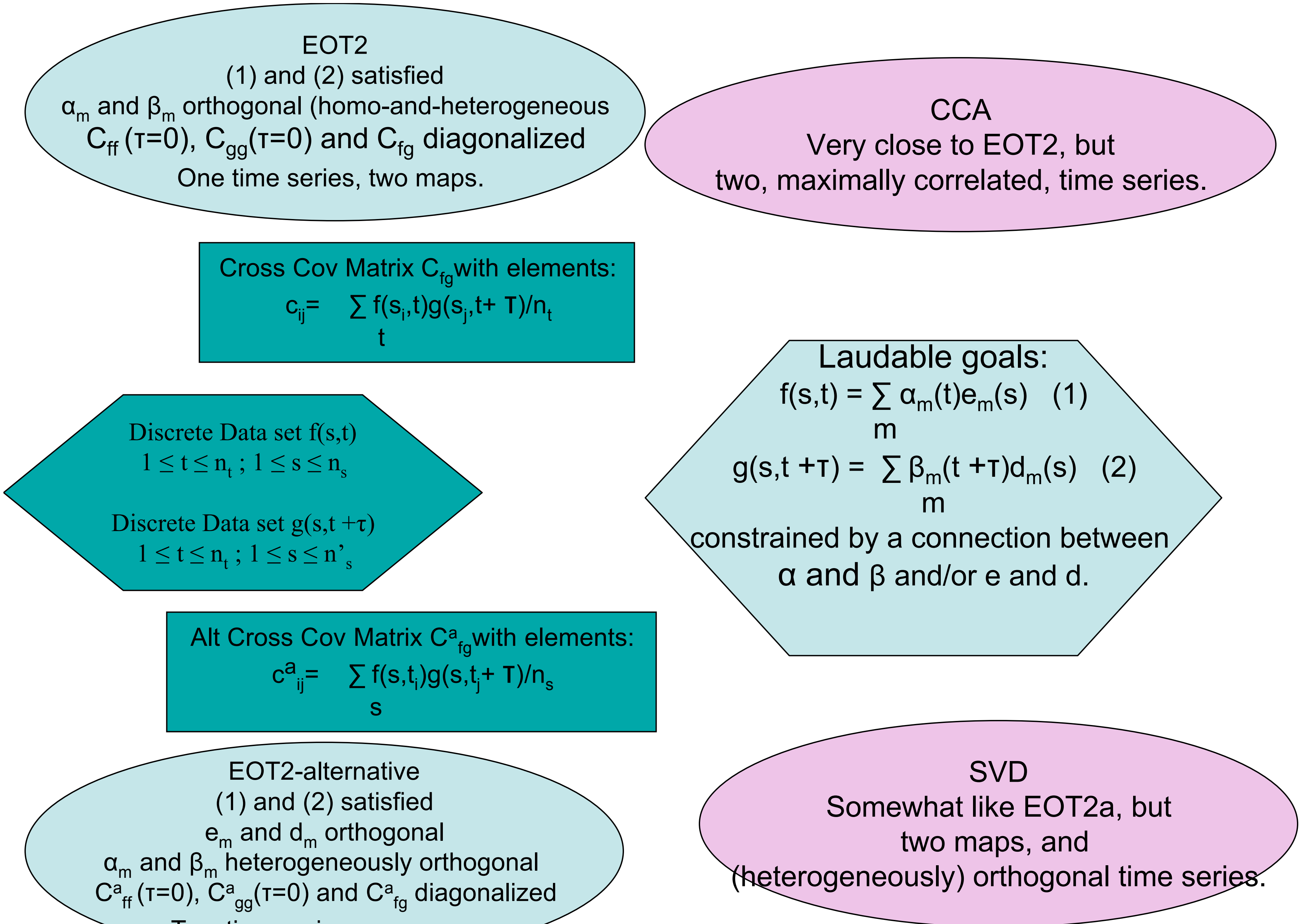

Fig.x.y: Summary of EOT2 procedures.

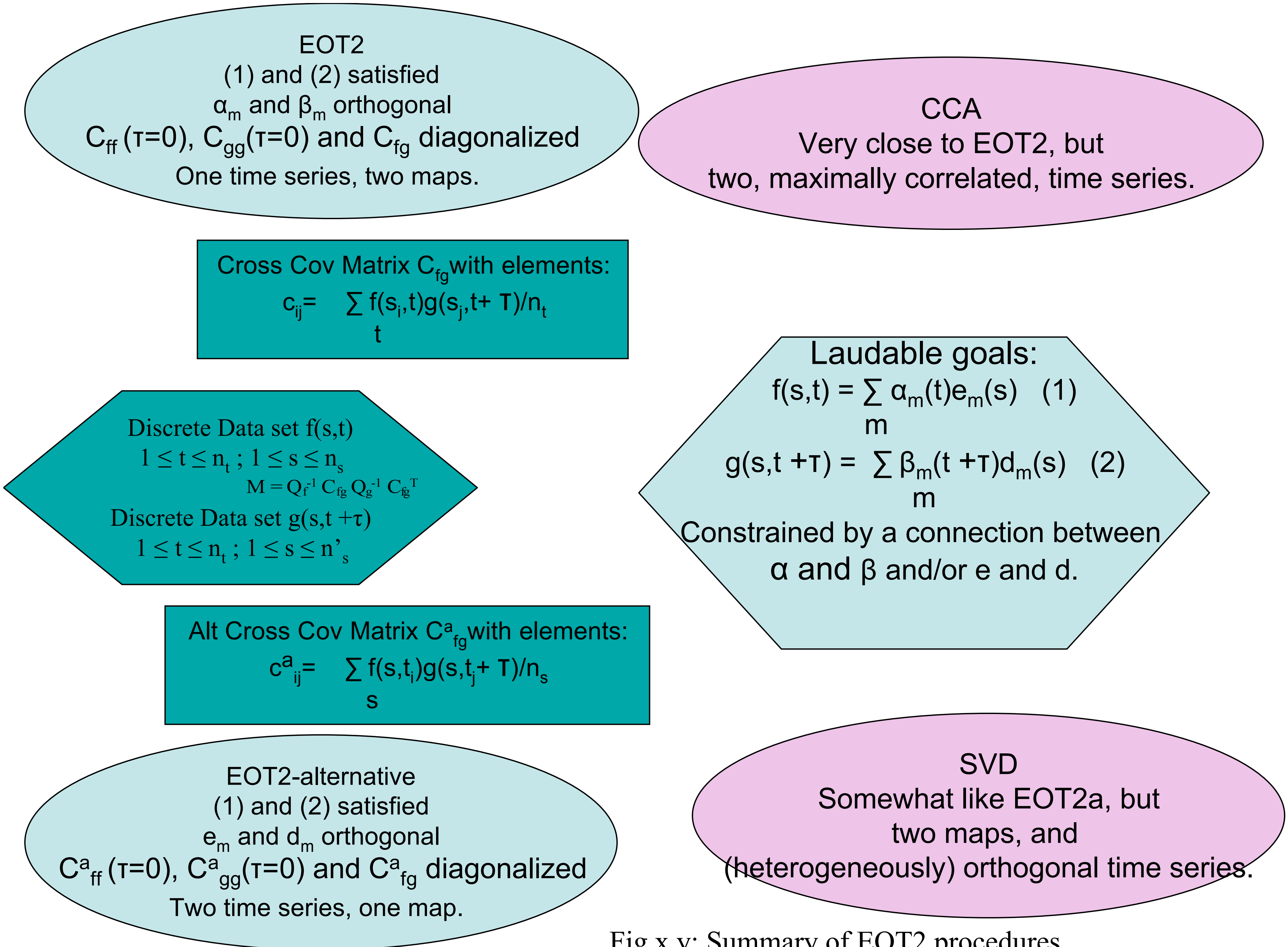

Fig.x.y: Summary of EOT2 procedures.

CCA:

1) Make a square $M = Q_f^{-1} C_{fg} Q_g^{-1} C_{fg}^T$

2) $E^{-1} M E = \text{diag}(\lambda_1, \lambda_2, \lambda_3, \ldots \lambda_M)$

➔ $\text{cor}(m) = \text{sqrt}(\lambda_m)$

SVD:

1) $U^T C_{fg} V = \text{diag}(\sigma_1, \sigma_2, \ldots, \sigma_m)$

Explained Squared Covariance = σ^2_m

Assorted issues:

1) Prefiltering f and g , before calculating C_{fg}
2) Alternative approach complicated when domains for f and g don't match
3) Iteration and rotation: CCA <-> EOT2-normal; SVD <-> EOT2-alternative ???

Keep in mind

- EV (EOF/EOT) and EOT2
- Squared covariance (SC) in SVD
- SVD singular vectors of C
- CCA eigenvectors of M
- LIM complex eigenvectors of L (close to C)
- MRK no modes are calculated (of L)