# List of Tables


2.1 Central wavelengths λ, full widths at half maximum δλ and primary use of the MERIS spectral channels . . . . . 4

2.2 Central wavelengths λ, full widths at half maximum δλ and primary use of the MODIS spectral channels . . . . . 6

2.3 Relationships between integrated optical depth scaling factors. Values in the first row (1) are from [6], values in the second row (2) are from this work. . . . . 13

2.4 Signal-to-noise ratios of the different MERIS and MODIS water vapour absorption and window channels used for the estimation of retrieval error due to sensor noise. . . . . 17

2.5 Root mean square errors of retrieved columnar water vapour above land from simulated radiances. For details, see text. . . . . 19

3.1 FTP transfer statistics for the Dundee Satellite receiving station and the DLR-DFD in Oberpfaffenhofen for the period January to August 2003. (The number in brackets are for the two central overpasses only) . . . . . 32

4.1 Summary of validation results for the satellite-based retrieval of atmospheric water vapour. # denotes the number of collocations, rmsd the *rms* deviation of differences, <> the averaged value from the validation data. All water vapour values are given in mm. In the second table, the statistics are calculated after a 2σ elimination, i.e. after the removal of absolute differences larger than twice the standard deviation. . . . . 44

5.1 Biases and root mean square deviations (rmsd) from all MODIS validations and comparisons presented in this work. . . . . 61