

Annual Report 2023

M. R. Schmidt

CAMK PAN, Warszawa, 2024

List of publications

Lithium in red novae and their remnants

Kamiński, T. Schmidt, M. Hajduk, M., Kiljan, A., Izviekova I., Frankowski A.
2023, A&A 672, A196

ExoMol line lists - LIV. Empirical line lists for AlH and AlD and experimental emission spectroscopy of AlD in $A^1\Pi (v = 0, 1, 2)$,

Yurchenko, S. N.; Szajna, W., Hakalla, R., Semenov, M., Sokolov, A., Tennyson, J., Gamache, R., Pavlenko, Y., Schmidt, M.R.
2024, MNRAS, 527, 9736

A radical transition in the post-main-sequence system U Equulei

Kamiński, T., Schmidt, M. R., Djupvik Anlaug, A., Menten, K. M., Kraus, A., Iłkiewicz, K., Steinmetz, T., Mobeen, Z., Szczerba, R.
2024, A&A

A bipolar structure and shocks surrounding the stellar-merger remnant V1309 Scorpii

Steinmetz, T., Kamiński, T., Schmidt, M., Kiljan, A.
2024, A&A

Projects

ESPRESSO/VLT spectra of VY CMa

with T. Kamiński,

Empirical line list of ScO A 2Pi - X 2Sigma system

with Y. Pavlenko

Update of line list of TiO B 3Pi - X 3Delta bands

with Y. Pavlenko



ExoMol line lists XXVIII: the rovibronic spectrum of AlH

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AlH lines in the blue spectrum of Proxima Centauri

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ExoMol line lists – LIV. Empirical line lists for AlH and AlD and experimental emission spectroscopy of AlD in A¹Π (v = 0, 1, 2)

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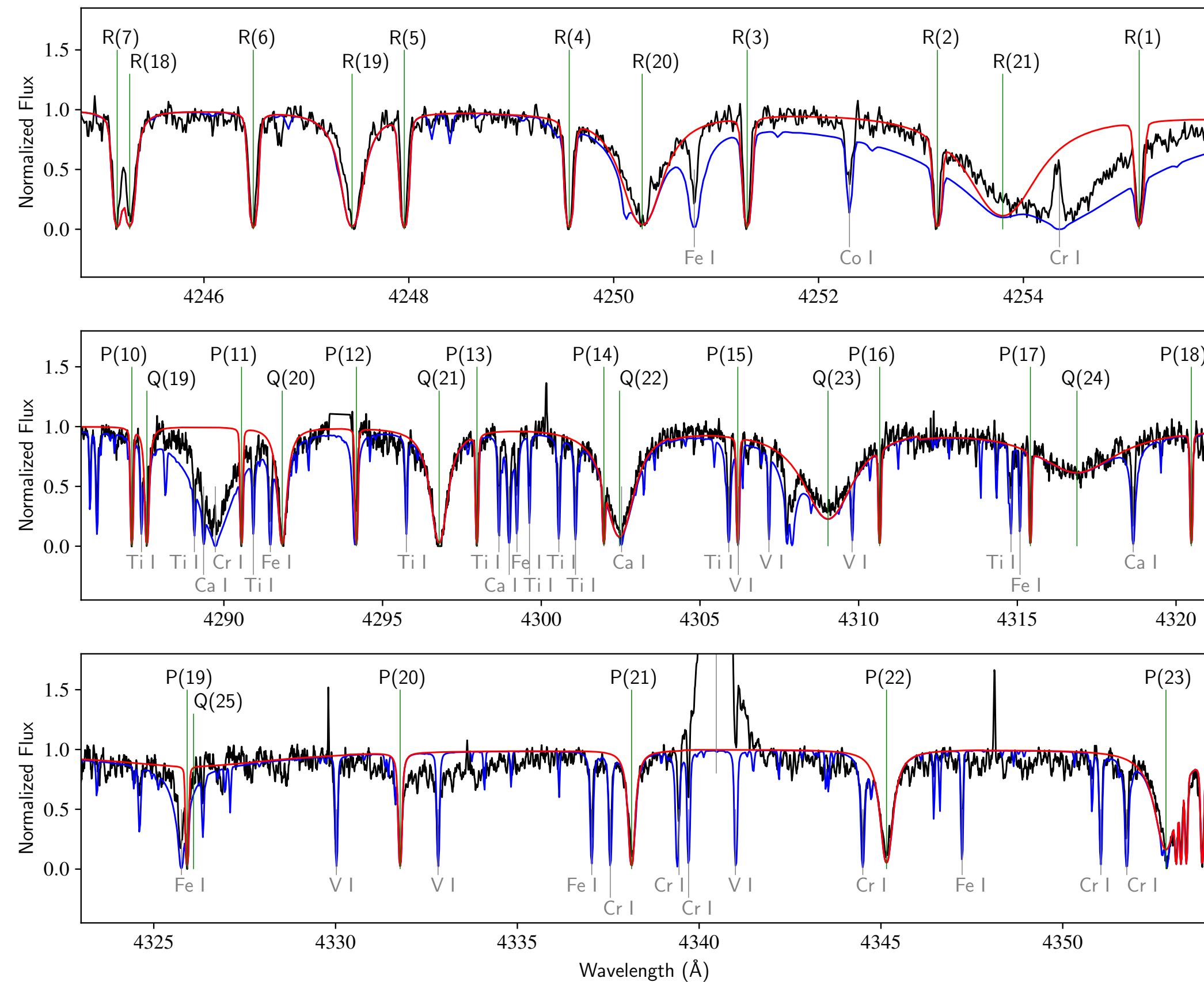
⁵Main Astronomical Observatory, Academy of Sciences of the Ukraine, 27 Zabolotnoho, UA-03143 Kyiv, Ukraine

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AIH in Proxima Centauri (M5.5 Ve $T_{\text{eff}}=2900$ K)

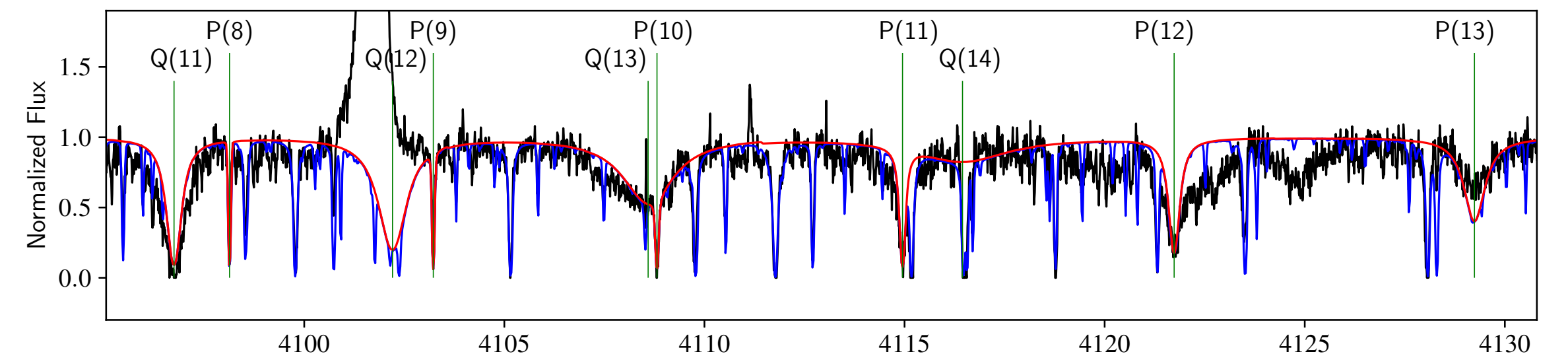
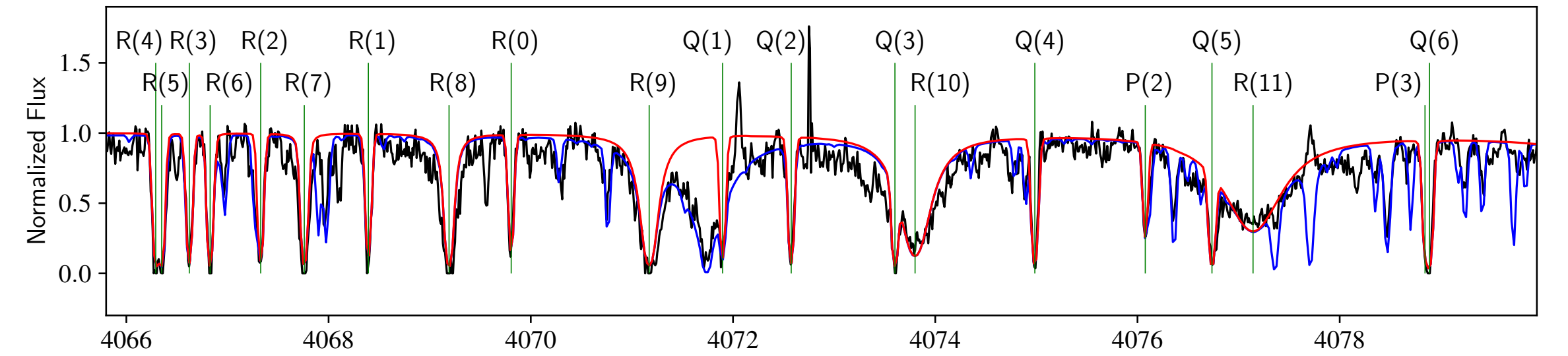
ExoMol - „complete” list of lines of AIH (AloHa) extended with radiative dampings

AIH $A^1\Pi - X^1\Sigma^+$ $v',v''=0,0$

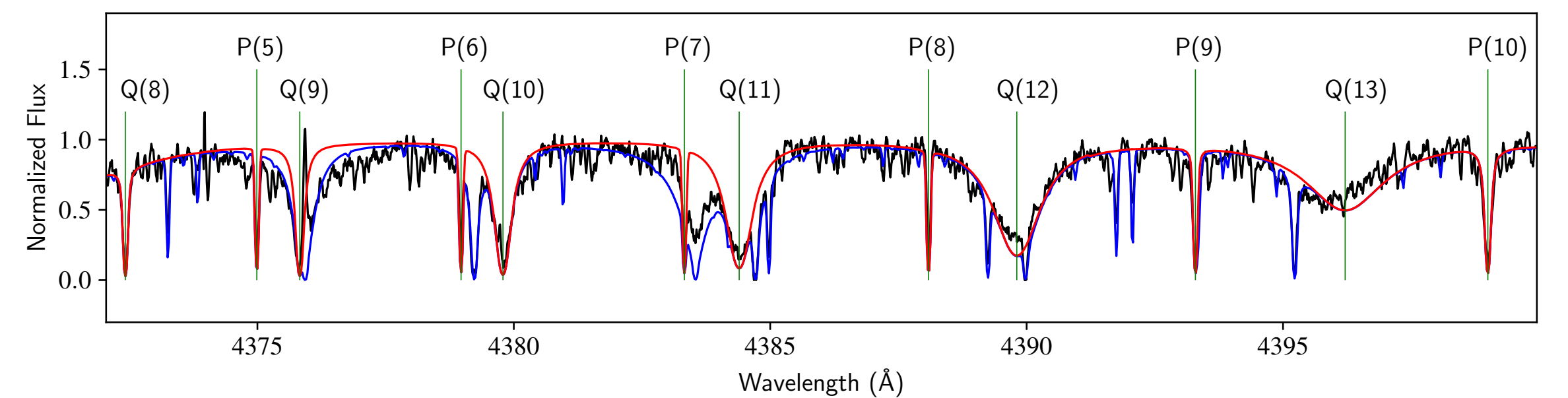
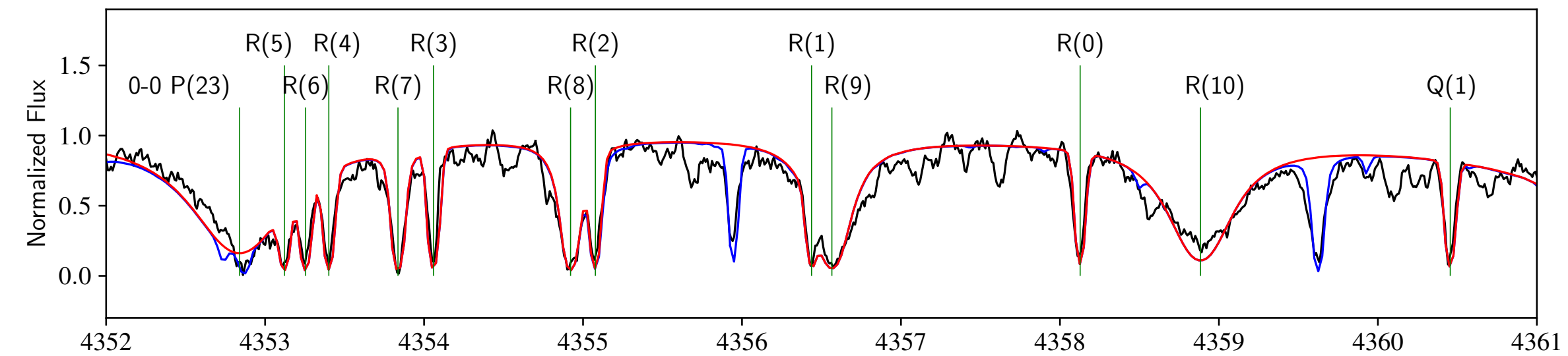


HARPS spectrum in black,
synthetic one with atomic lines in blue, synthetic AIH in red,

Band 1,0

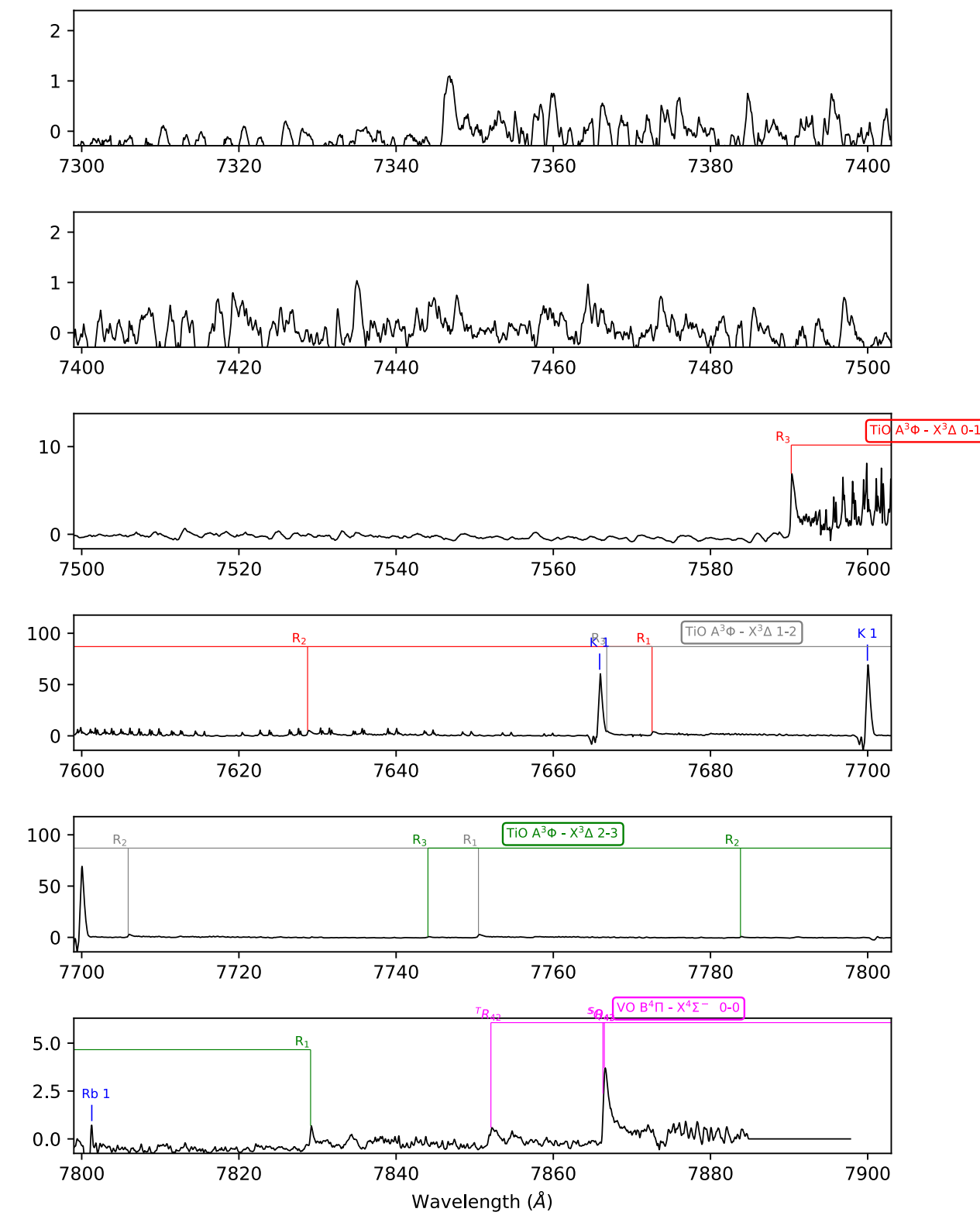
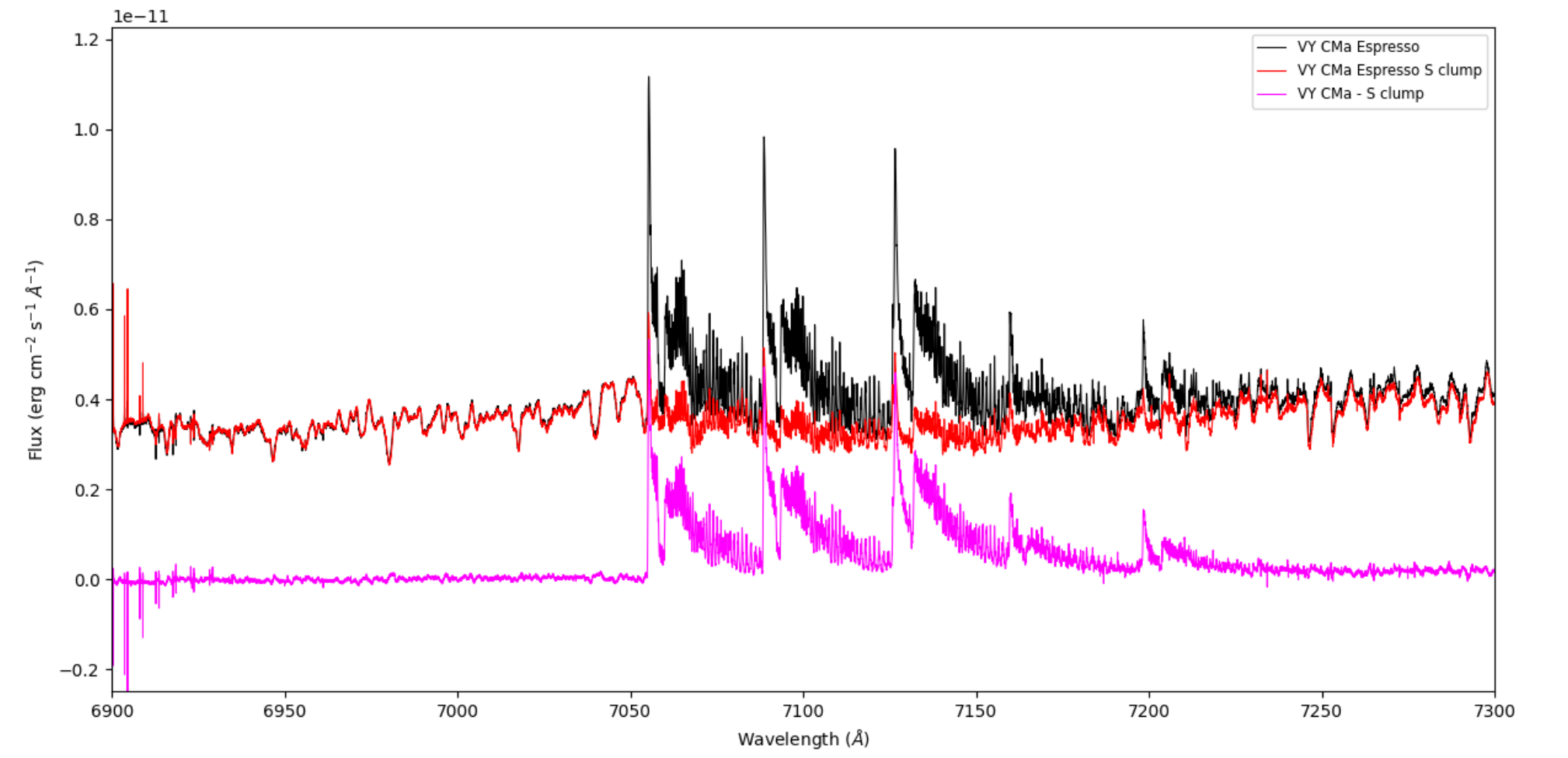
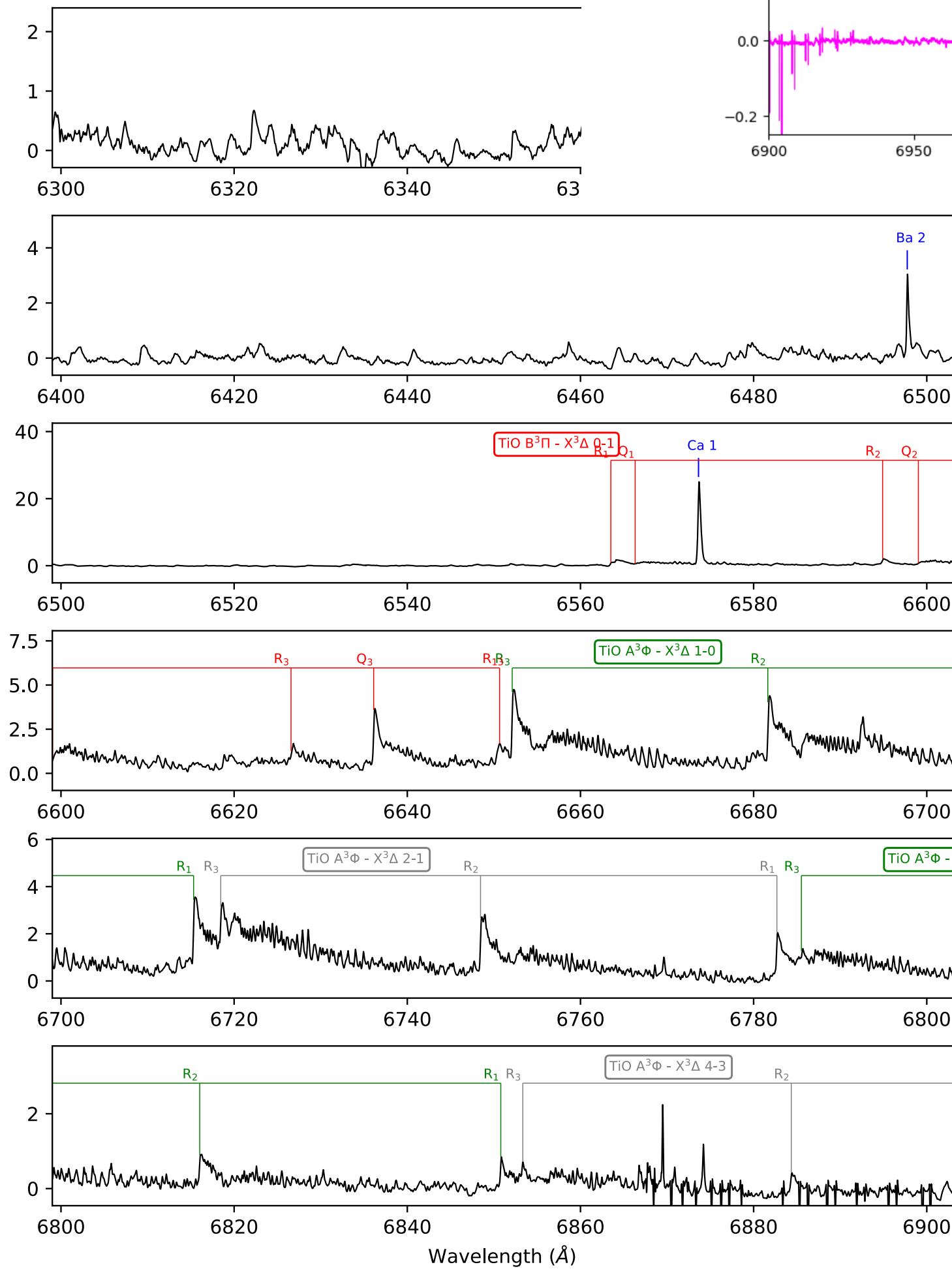
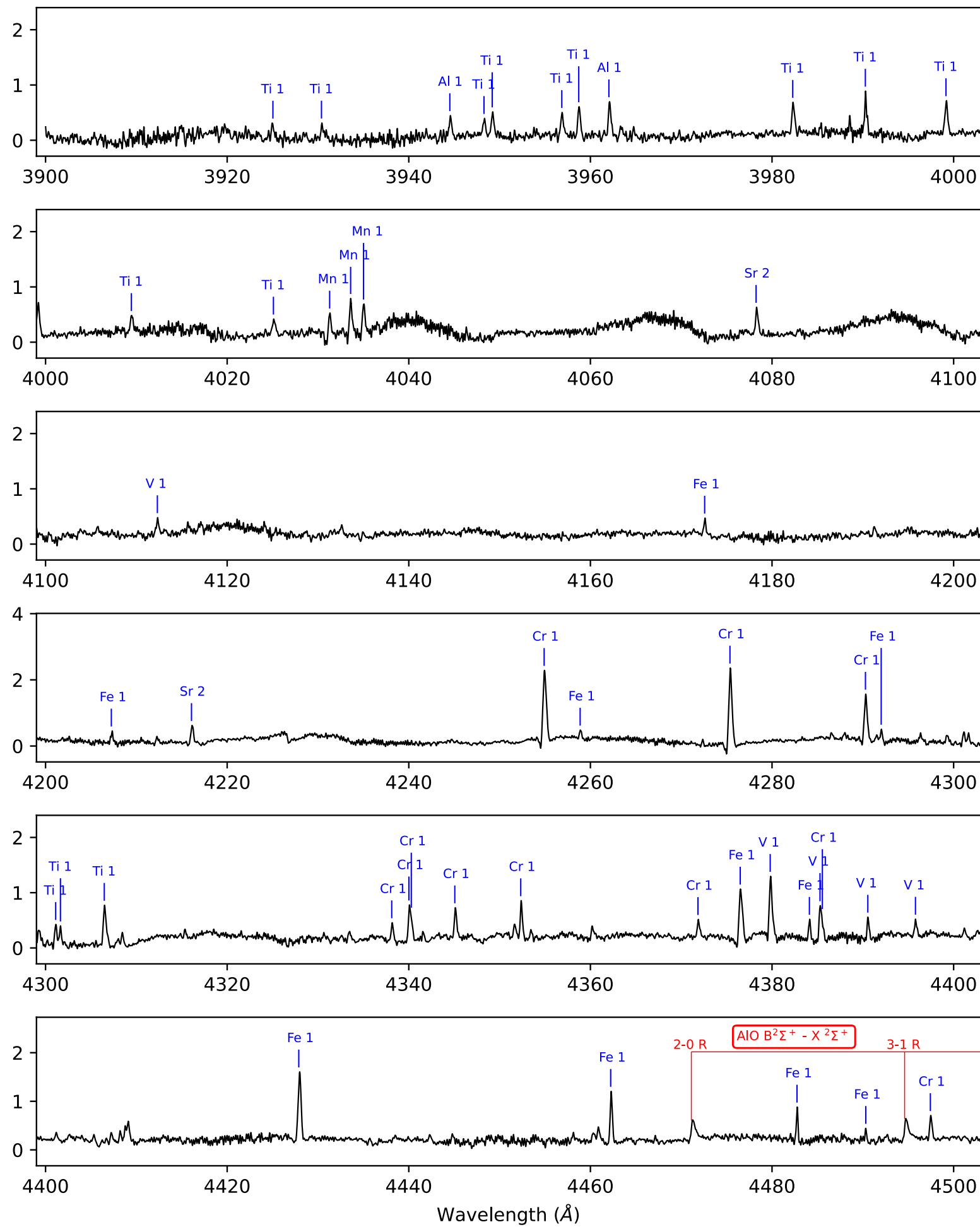


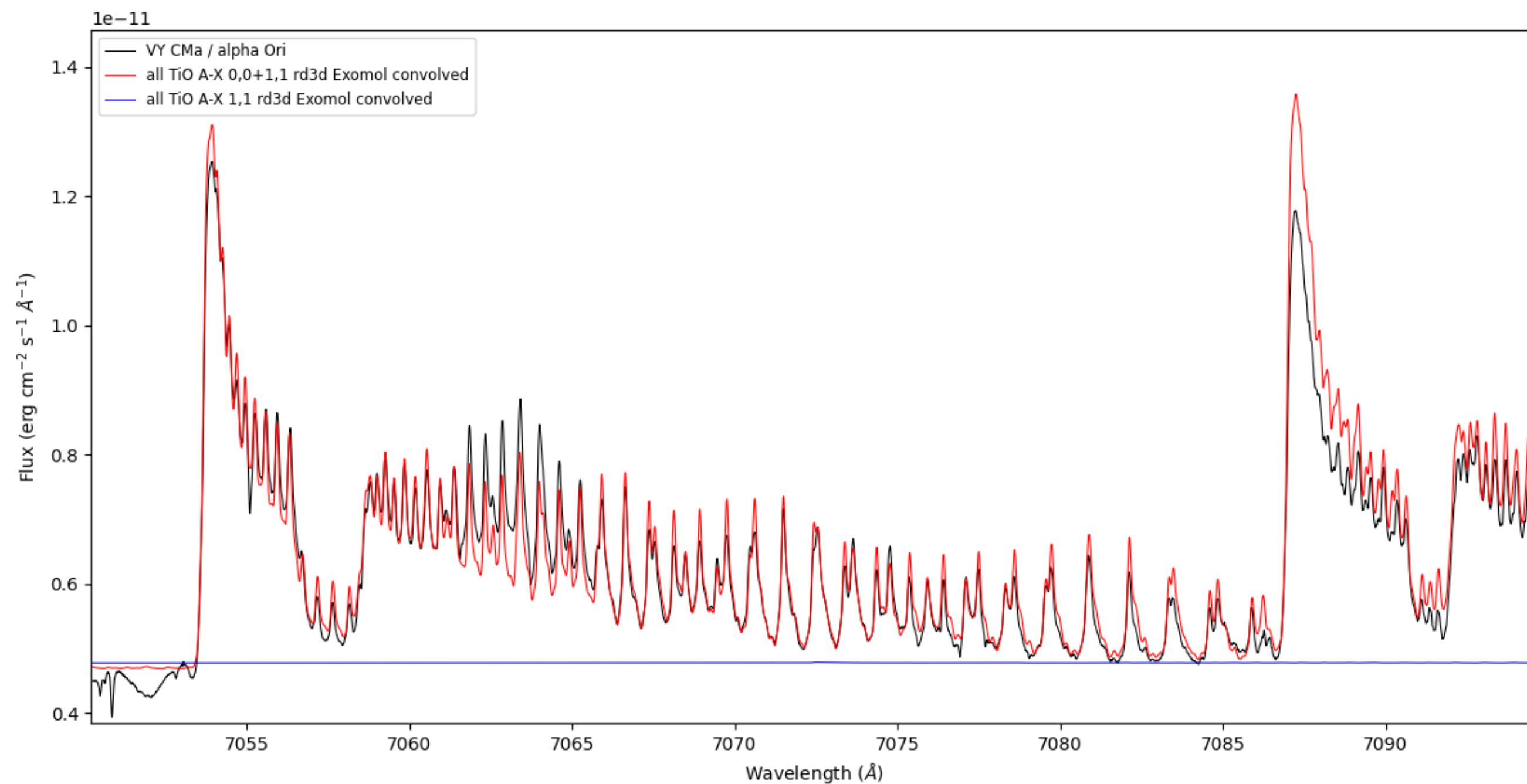
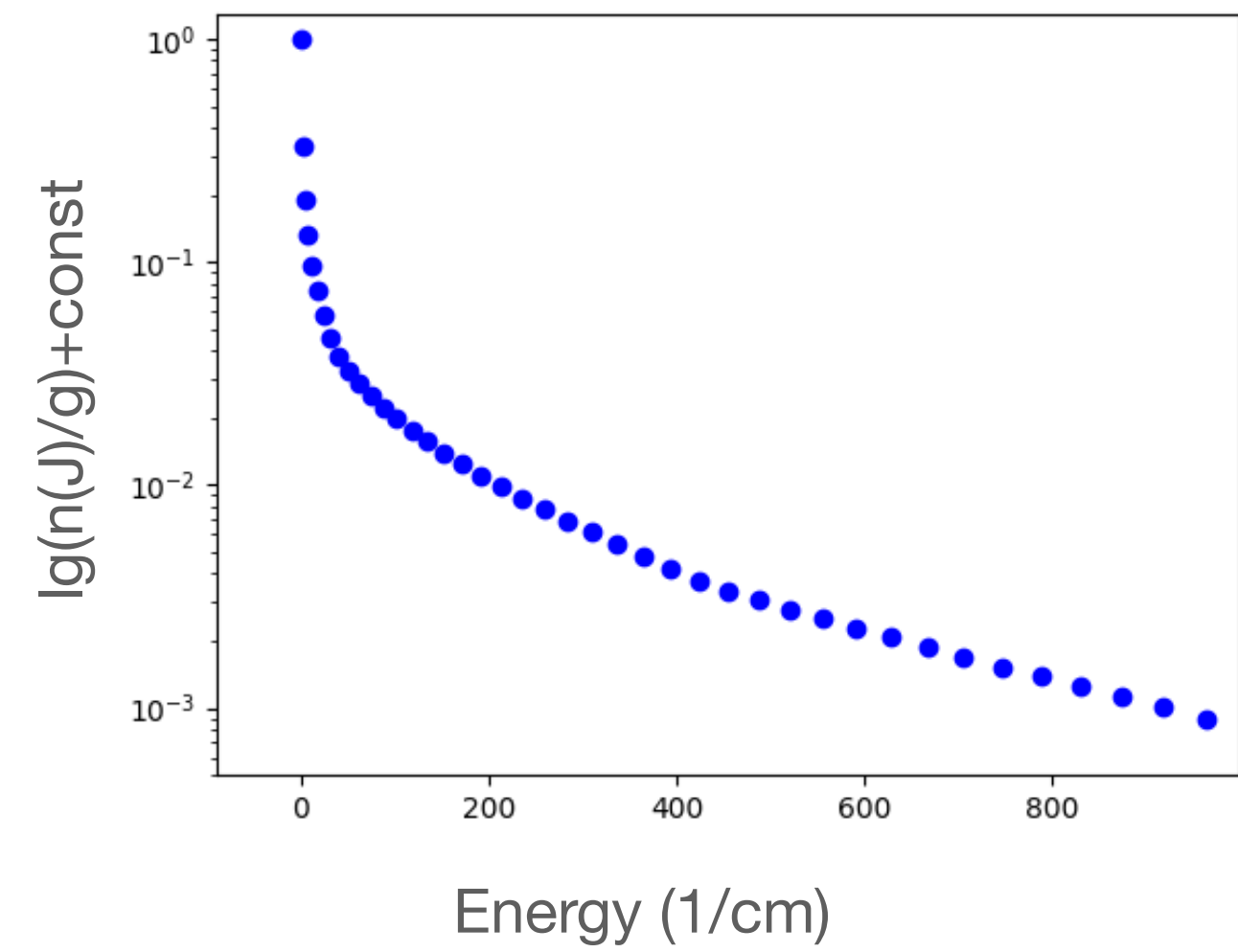
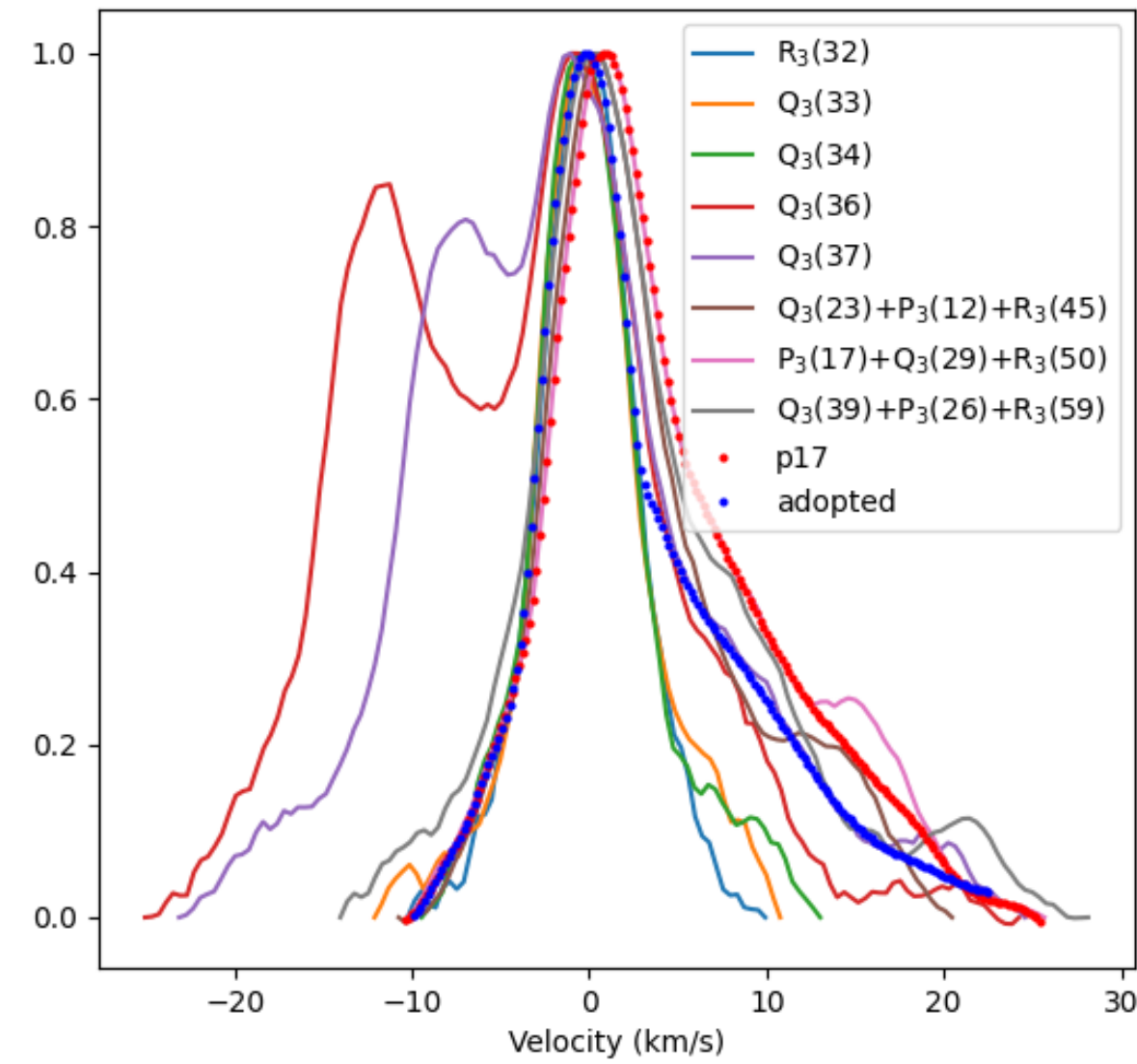
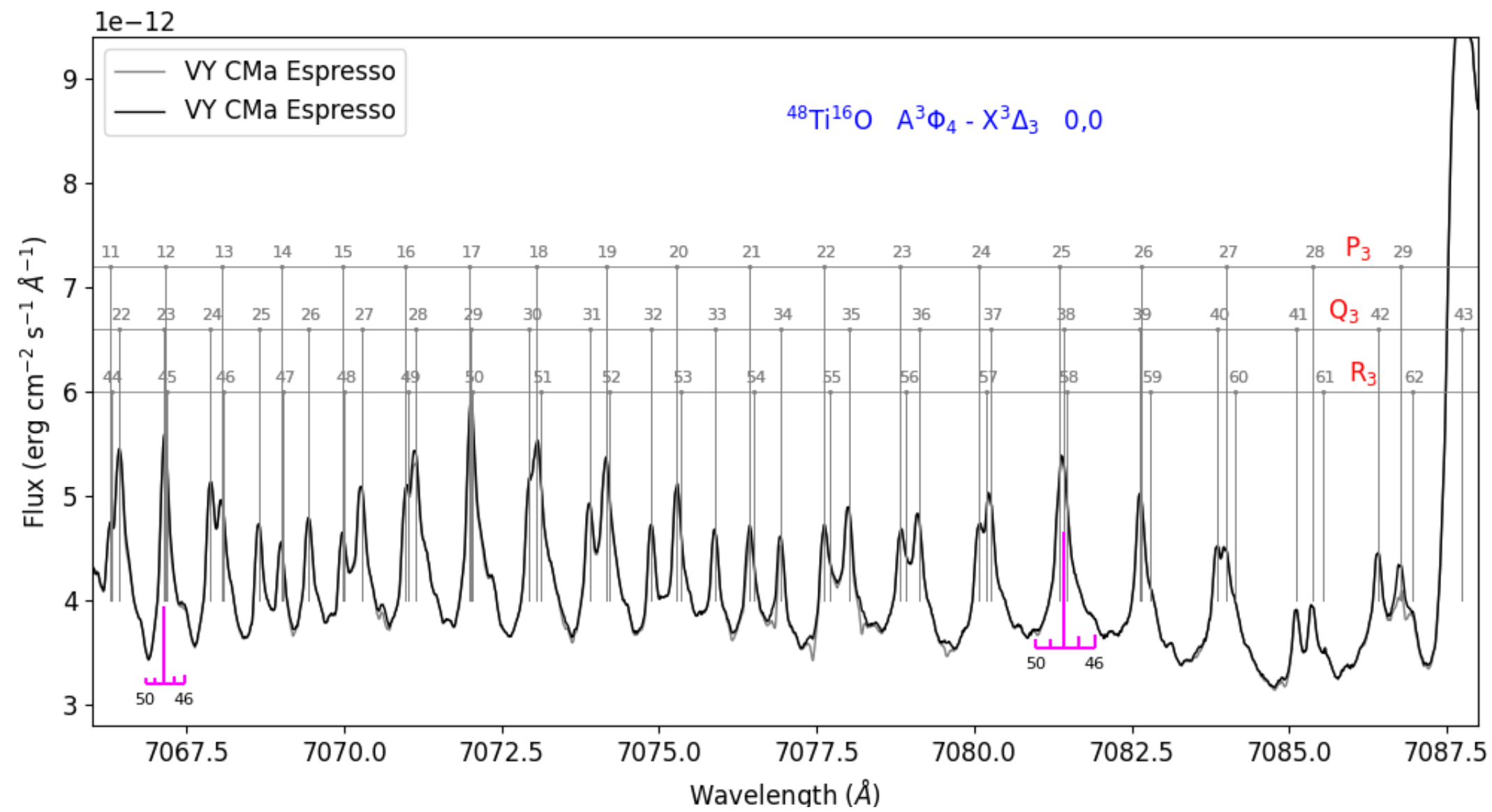
Band 1,1



Extreme red supergiant VY CMa

ESPRESSO spectra - emission component



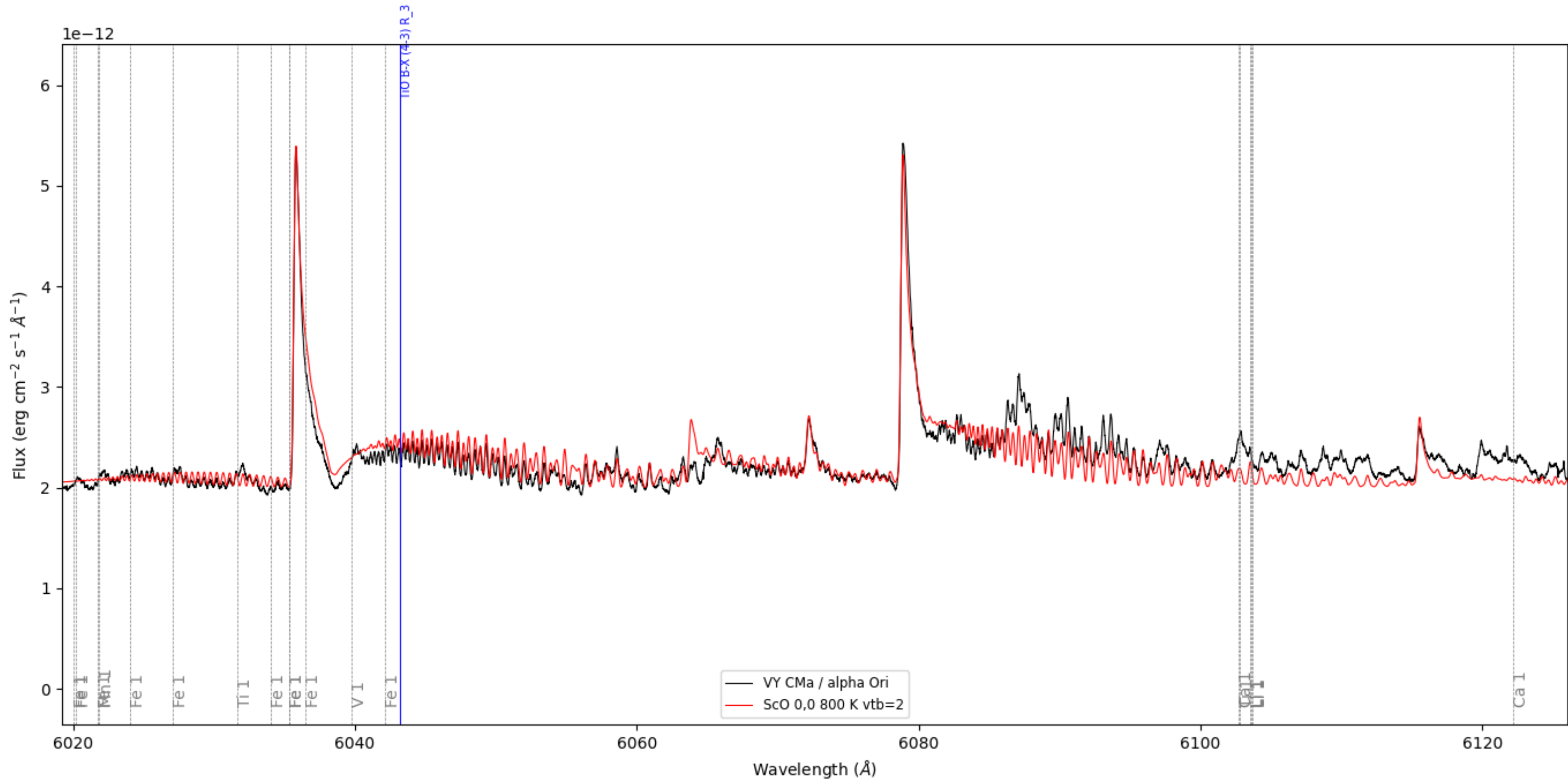


Molecular emission originates in the distant part of the circumstellar envelope in the gas of temperature of slightly above 100 K

There is no contradiction with earlier estimations of excitation temperature of 700 K and with large distant for emitting area from the photosphere

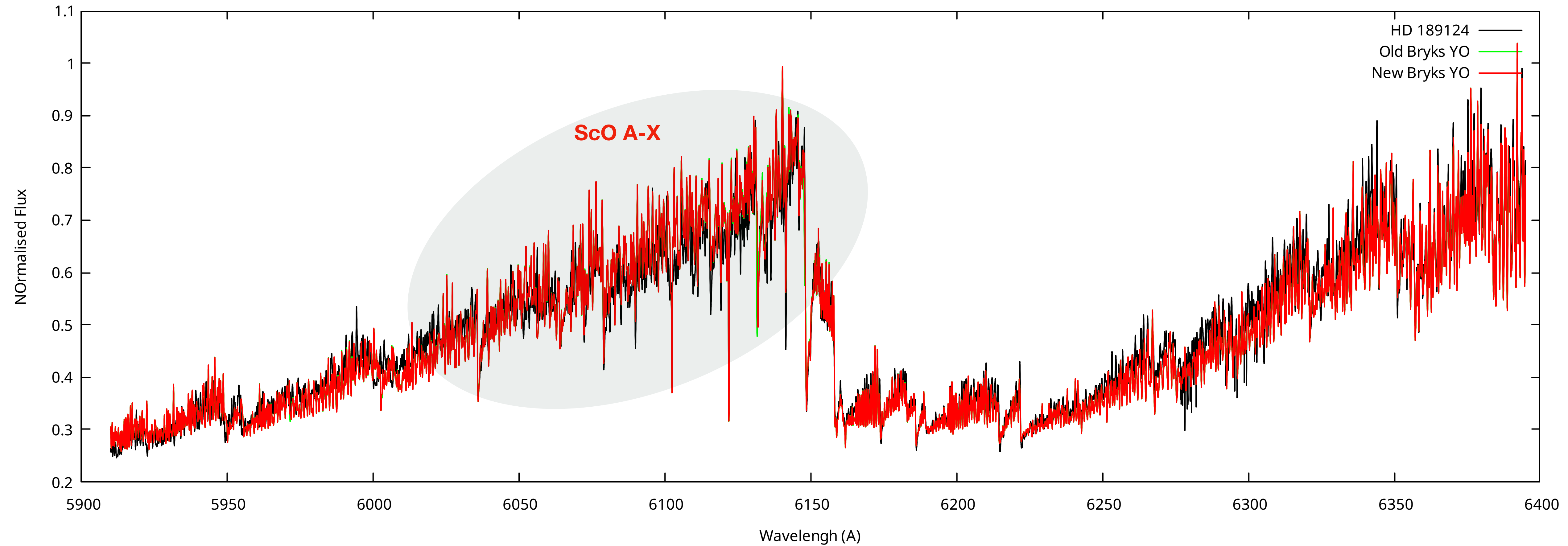
Empirical list of lines of ScO A-X band and its verification in spectra of M-type stars

collaboration with Y. Pavlenko (Main Astronomical Observatory, UAS Kiev)



Synthetic spectrum of HD189124 with Exomol TiO, YO and ScO

3000/0.0/0.0



Spectral analysis of laboratory spectrum of TiO B-X (system gamma')

Bands $v=2-1, 3-2, 4-3$ (already analysed), $5-4$ (probably), $6-5$ (extrapolated)

