RevMexAA (Serie de Conferencias), **17**, 205–205 (2003)

SULPHUR ABUNDANCES AND LINE TEMPERATURES IN A SAMPLE OF HII GALAXIES

E. Pérez-Montero,[1] A.I. Díaz,[1] J. Zamorano[2] and J. Gallego[2]

We present long-slit observations in the red and near infrared of 12 HII galaxies made with the Isaac Newton Telescope at the Roque de los Muchachos Observatory in 1999 February and 2000 January. The spectral range includes the sulphur lines [SII] at 6717, 6731 Å and [SIII] at 9069, 9532 Å. For all the observed galaxies, ion-weighted temperatures from optical forbidden auroral to nebular line ratios have been obtained in order to study the inner ionization structure of these high excitation objects, as well as the oxygen and sulphur abundances.

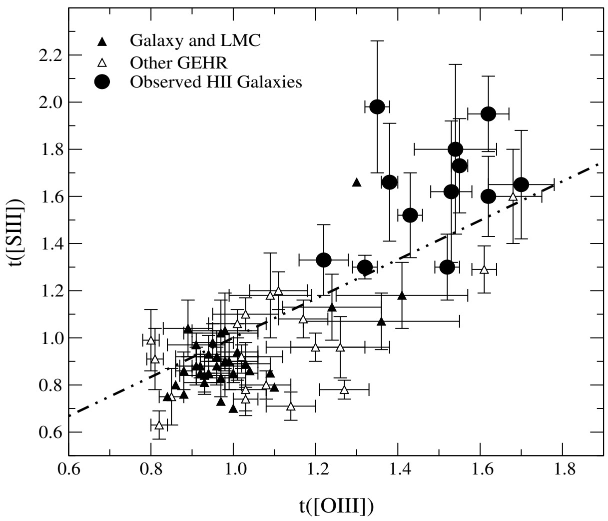
There are data available in the literature for all these objects corresponding to the blue and visible part of the spectrum with an excellent agreement in the overlapping spectral region. The reduction and analysis of the data gives the following results for the observed objects:

Object	t[OIII]	t[SIII]	log(O/H)	log(S/O)
IIZw40	1.32±0.03	1.30±0.03	-3.91	-1.84
Mrk 5	1.22±0.06	1.33±0.16	-3.95	-1.81
0749+568	1.54±0.10	1.86±0.36	-4.12	-1.90
0926+606	1.43±0.03	1.52±0.18	-4.00	-1.73
Mrk 709	1.70±0.08	1.65±0.23	-4.27	-1.63
Mrk 22	1.35±0.03	1.98±0.28	-3.93	-1.83
Mrk 1434	1.55±0.02	1.73±0.20	-4.15	-1.91
Mrk 36	1.53±0.05	1.62±0.30	-4.01	-1.83
VIIZw403	1.52±0.03	1.30±0.14	-4.27	-1.57
UM 461	1.62±0.05	1.95±0.16	-4.11	-1.81
UM 462	1.38±0.02	1.66±0.25	-4.00	-1.79
Mrk 209	1.62±0.01	1.60±0.17	-4.19	-1.68

The knowledge of both t[OIII] and t[SIII] allows more accurate abundance determinations and provides a better understanding of the inner ionization structure. The relation between these two temperatures proposed by D.Garnett (1992) for ionic temperatures is widely used:

$$t(S^{2+}) = 0.83t(O^{2+}) + 0.17.$$

Both almost coincide in this high excitation regime. We have represented this relation with some direct measurements of both temperatures for both low and high excitation regimes. It is clear that the fit to the relation is good at low temperatures, except for a small systematic effect due to the use of the new set of atomic coefficients for [SIII] from Tayal & Gupta (1999) that yields lower t[SIII]. However, in the high excitation regime the data deviate appreciably from the expected relation and show a larger dispersion. Both these facts must be further investigated since the possible effects in the determination of ionic abundancies of S^{2+} may be non negligible.



REFERENCES

Díaz, A.I., Pérez-Montero, E., 2000, MNRAS, 312, 130.
Garnett, D.R. 1992, AJ, 103, 1330.
Izotov, Y.I., Thuan, T.X. & Lipovetsky, V.A. 1994, ApJ, 435, 647.
Izotov, Y.I., Thuan, T.X. & Lipovetsky, V.A. 1997, ApJSS, 108, 1.
Izotov, Y.I. & Thuan, T.X 1998, ApJ, 500, 188.
Kunth, D. & Sargent, W.L.W. 1983, ApJ, 273, 81.
Pagel, B.E.J., Simonson, E.A., Terlevich,R.J. & Edmunds, M.G. 1992, MNRAS, 255, 325.
Tayal, S.S. & Gupta, G.P. 1999, ApJ, 526, 544.

[1]Dpto. de Física Teórica. Universidad Autónoma de Madrid. Cantoblanco. 28049. Madrid. Spain (enrique.perez@uam.es, angeles.diaz@uam.es).
[2]Dpto. de Astrofísica. Universidad Complutense de Madrid. 28040. Madrid. Spain (jaz@astrax.fis.ucm.es, jgm@astrax.fis.ucm.es.)

Galaxy Evolution: Theory and Observations (Cozumel, Quintana Roo, México, 8-12 April 2002)
Editors: Vladimir Avila-Reese, Claudio Firmani, Carlos S. Frenk & Christine Allen