



Contribution ID : 25

Type : **Contributed talk**

# Broad spectral line variability of the changing-look AGN NGC 3516: Role of a dusty broad line region

*giovedì 29 giugno 2023 16:15 (15)*

Here we present our study of the variability of the broad H $\beta$  line profile of the “changing look” active galactic nucleus (CL-AGN) NGC 3516 over a long period (from 1996 to 2021). We model the broad line profiles assuming that there is emission from the accretion disc superposed with emission from a surrounding region that is outside the disc. We find that in the Type 1 activity phase (i.e., when the strong broad emission lines are observed), the broad line region (BLR) is very complex. There is a clear disc-like BLR contributing to the broad line wings and an additional intermediate line region (ILR) contributing to the line core. In the high activity phase, the ILR emission is close to the center of the line (slightly shifted to red in some cases), whereas in the low activity phase (i.e., Type 2 phase), the ILR component is clearly shifted to blue, indicating outflow. At different activity stages, the complex BLR structure can be detected, indicating that the gas motion remains constant but the line emission becomes weak. This may be caused by dust entering the interior of the BLR during the low activity stage, forming a dusty BLR. This leads to a decrease in ionization and recombination rates, so that the broad lines almost disappear.

**Primary author(s) :** Prof. POPOVIC, Luka C. (Astronomical Observatory, Belgrade); Prof. ILIC, Dragana (University of Belgrade - Faculty of Mathematics); BURENKOV, Alexandar (Special Astrophysical Observatory); MANUEL PATINO ÁLVAREZ, Victor (Instituto Nacional de Astrofísica, Óptica y Electrónica, Apartado Postal 51-216, 72000 Puebla, Puebla, México); MARCETA-MANDIC, Sladjana (Astronomical Observatory, Volgina 7, 11000 Belgrade, Serbia); KOVACEVIC - DOJCINOVIC, Jelena (Astronomical Observatory, Volgina 7, 11000 Belgrade, Serbia); SHABLOVINSKAYA, Elena (Special Astrophysical Observatory of the Russian AS, Nizhnij Arkhyz, Karachaevo-Cherkessia 369167, Russia ); KOVACEVIC, Andjelka (Department of Astronomy, University of Belgrade - Faculty of Mathematics, Studentski trg 16, 11000 Belgrade); MARZIANI, Paola (INAF Osservatorio Astronomico di Padova, Vicolo dell'Osservatorio 5, Padova, Italy); CHAVUSHYAN, Vahram (Instituto Nacional de Astrofísica, Óptica y Electrónica, Apartado Postal 51-216, 72000 Puebla, Puebla, Mexico); WANG, Jian-Min (Key Laboratory for Particle Astrophysics, Institute of High Energy Physics, Chinese Academy of Sciences, 19B Yuquan Road, Beijing 100049, China); LI, Yan-Rong (Key Laboratory for Particle Astrophysics, Institute of High Energy Physics, Chinese Academy of Sciences, 19B Yuquan Road, Beijing 100049, China); MEDIAVILLA, Evencio G. (Instituto de Astrofísica de Canarias, Vía Láctea S/N, La Laguna 38200, Tenerife, Spain)

**Presenter(s) :** Prof. POPOVIC, Luka C. (Astronomical Observatory, Belgrade)

**Session Classification :** Extreme variability: CL AGN, TDEs and binary SMBHs