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Spectroscopic monitoring of early stage post-AGB stars

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The role of different processes in shaping of planetary nebula (PN) around post-AGB stars is not fully understood. Recently, binary interactions have been thought of as the main shapers of PN; however, multiple studies seem to suggest that the role of companions might be overestimated or even question current post-AGB star evolutionary models. It is possible that an intrinsic change in nature of stellar wind during the post-AGB phase plays an important role in the formation of the PN. Our recent studies of the bright post-AGB stars IRAS 22272+5435 and HD 161796 have already revealed seemingly wind-related processes in their atmospheres. Shocks and both cool and warm outflows have been observed. Also, matter falling onto the star has been detected and we have embarked on determination of precise evolutionary rates for these objects. High-resolution spectroscopic monitoring over pulsation cycle of post-AGB stars is a useful tool for study of dynamical phenomena in their atmospheres and shells. We propose to use NOT/FIES for monitoring of homogeneous sample of cool post-AGB stars to study long-term variations and to determine the evolutionary rates. Also, FIES will provide data for studies of short-term spectral variability. The forthcoming NTE instrument will allow us to extend spectral variation studies to the near infrared, unveiling variation in more spectral lines of different species and excitation energies, thereby probing dynamics in a wider range of the extended atmospheres of such stars.

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