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TITLE: The young and compact planetary nebulae M3-27 and Hen 3-1357 (the Stingray)

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ABSTRACT:

The very young PNe Hen 3-1357 and M3-27 are characterized by showing fast changes. In both cases the high ionization lines [OIII]4959, 5007 have been decreasing with time. In the case of Hen 3-1357 this has been attributed to a fast evolution of the central star that in 20 years evolved from a post AGB B supergiant to a central star with effective temperature of 60,000 K in 2002. Then the effective temperature decreased to 40,000 K in 2011. The stellar temperature is still decreasing and the nebula shows signs of recombination. Some authors have suggested that a Late Thermal Pulse has occurred in this star.

In the case of M3-27 it is not evident that the [OIII]5007 line variations are due variations in the stellar effective temperature, rather the line variations seems to be due to changes in the nebular densities as this nebula has an inner very dense zone (density larger than 10^6 per cubic centimeter) where the nebular lines are suppressed. The central star is emitting in the Balmer lines which show double profile and very extended wings, such stellar emissions have fastly varied with time. A complete analysis of both PNe will be presented in this contribution.