

# REASSESSING THE QUIESCENCE OF EARLY-TYPE GALAXIES

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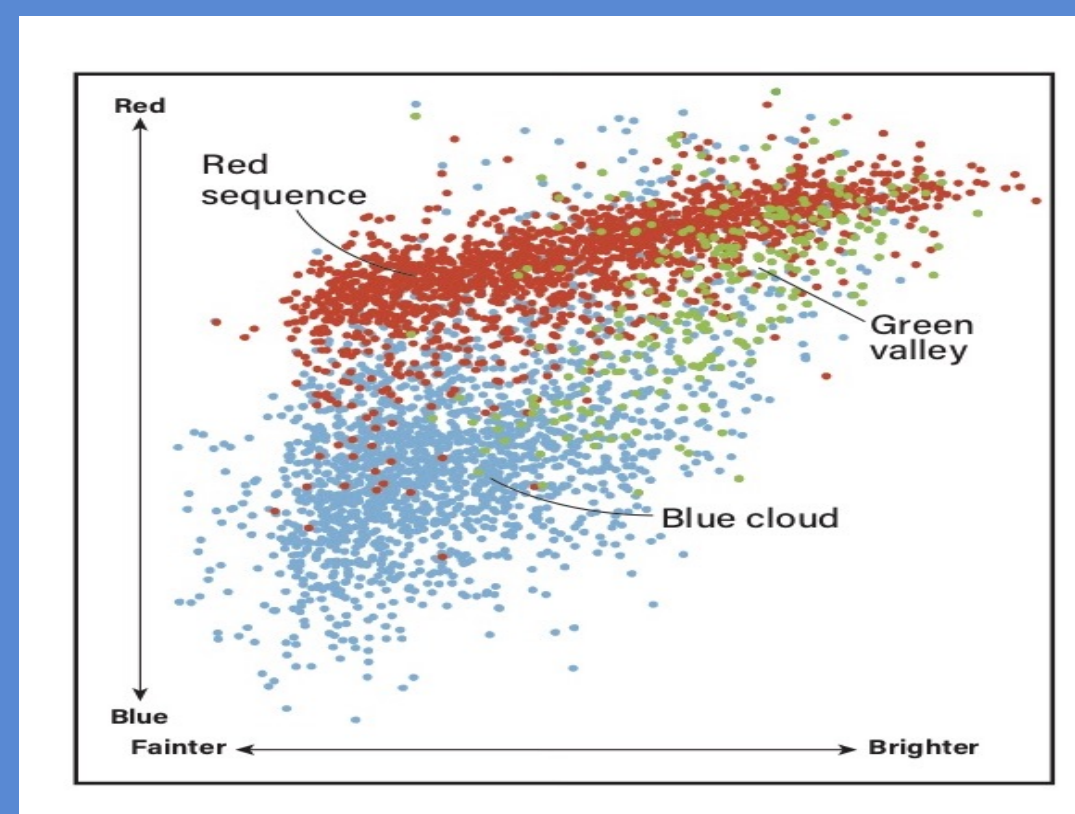
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## INTRODUCTION

Most galaxies in the Universe fall into two broad classes in the colour-luminosity plane: a 'red sequence' of largely quiescent, typically early-type, old and metal-rich systems, or within a 'blue cloud' of star-forming (SF), later-type, more metal-poor and usually less massive objects.



It is believed that these quiet galaxies have no molecular clouds which support the formation of stars. Quiet galaxies have elliptical morphologies; as well as a distinct reddish spectra that spotlights the absence of starformation signature emission lines such as: H $\alpha$ , H $\beta$ , [OIII], [OII], [NII].

## MOTIVATION

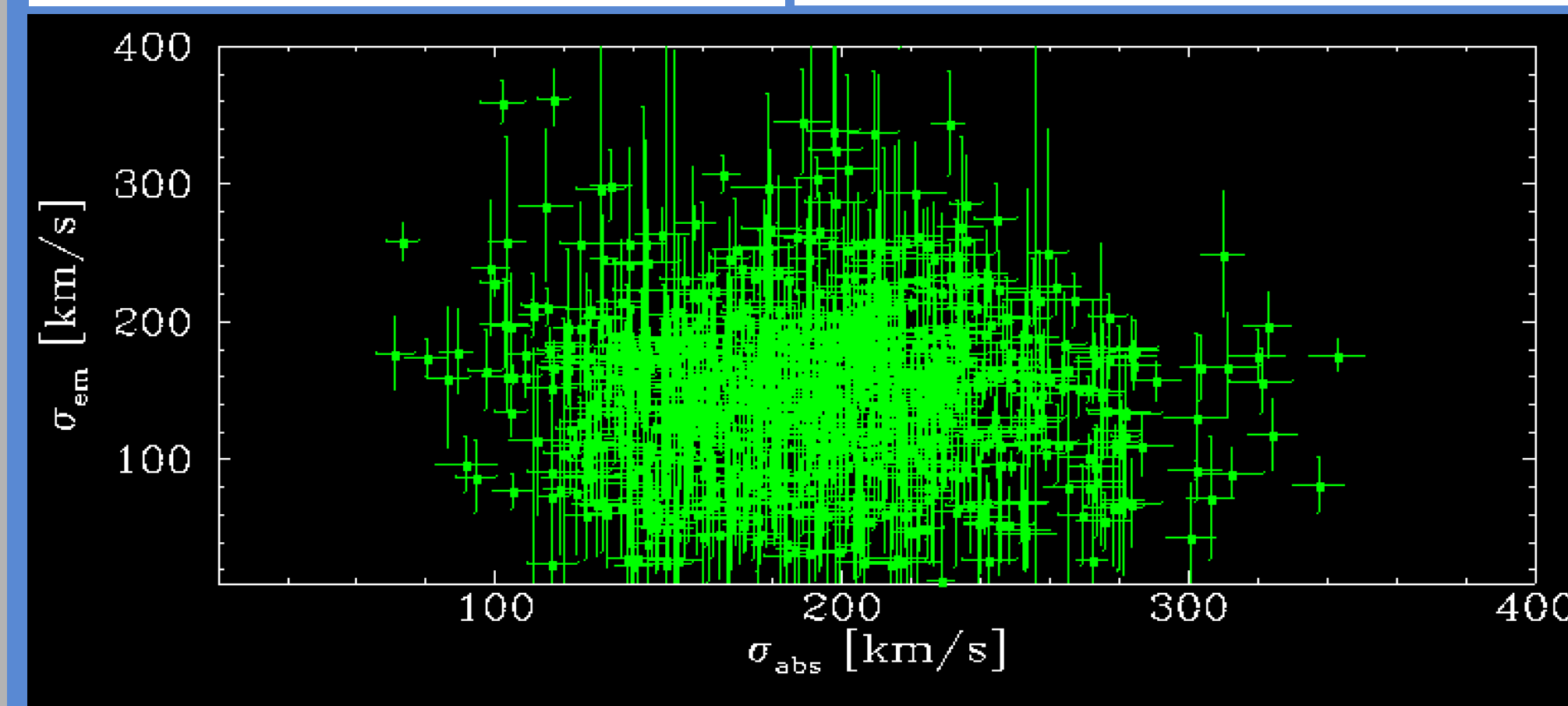
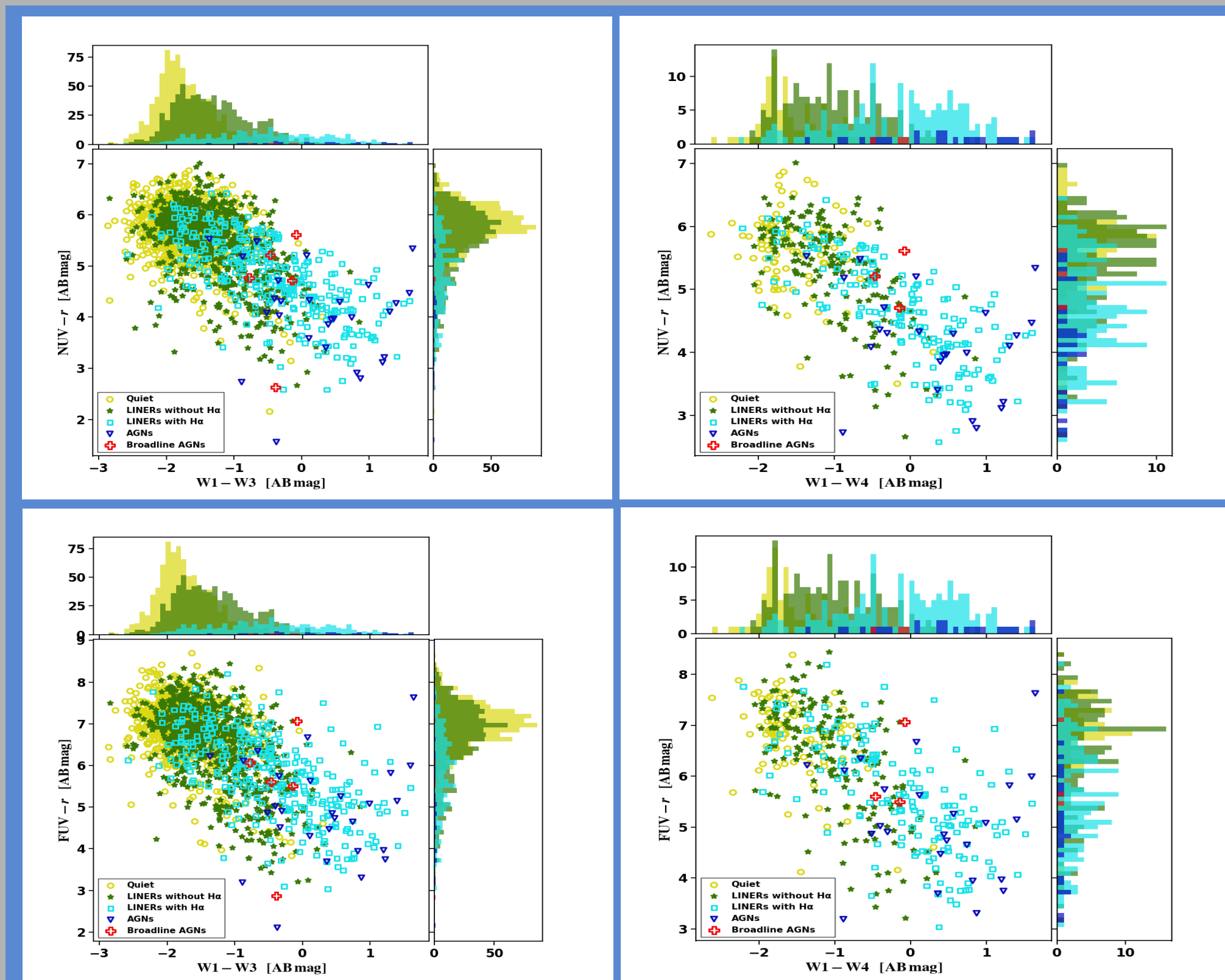
We revisited a sample of 3417 early-type galaxies from Hernández-Pérez & Bruzual, 2014 (HB14) spanning the redshift range  $0.1 < z < 0.3$ . We find that there are numerous instances where their selection criterion included spirals, star forming galaxies, and AGN while not excluding LINERS. The HB14 criterion are listed below:

Seyfert:  $[NII]/H\alpha > 0.6$  and  $[OIII]/H\beta > 3$

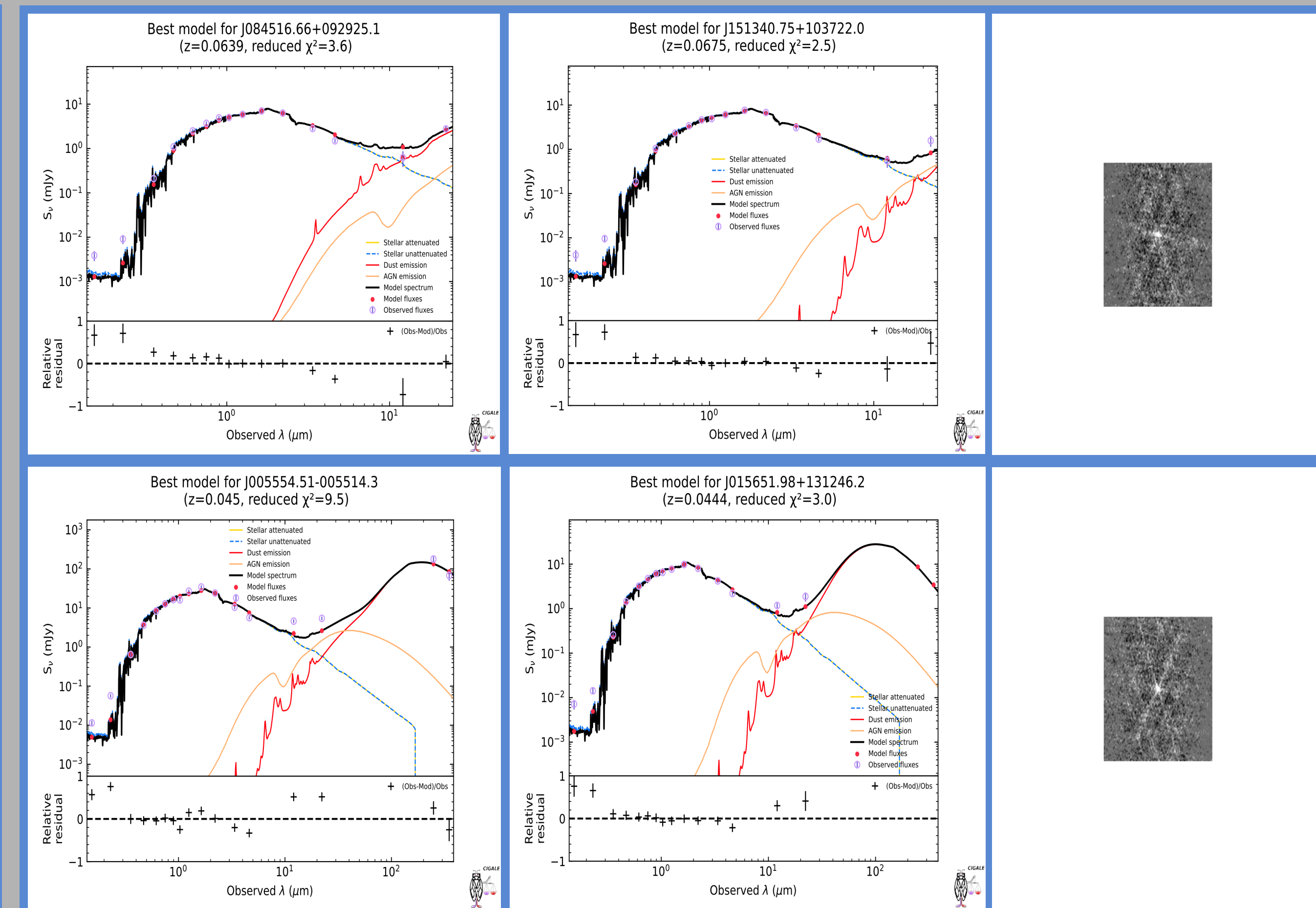
LINER:  $[NII]/H\alpha > 0.6$  and  $[OIII]/H\beta < 3$

Star Burst (SB):  $\log[OIII]/H\beta > 0.61$ ;  $\log[NII]/H\alpha - 0.05 > 1,3$

## DIAGNOSIS



## RESULTS



## TAKE HOME

- (1) The 3417 sources from Hernandez-Perez and Bruzual were not quiet.
- (2) There's no correlation between the observed excesses (UV and IR).
- (3) Polycyclic Aromatic Hydrocarbon (PAH) was responsible for the observed 12  $\mu$ m excesses and warm dust for the 22  $\mu$ m excesses.