Near Field Cosmology: Characterizing the Properties Leading to Radiation Leakage in Local Low- and Intermediate-Mass Galaxies ()

Pilon, Andrew (*Physics and Astronomy, University of San Francisco, San Francisco, CA, United States*);
Olivieri Villalvazo, Mario A. (*Physics and Astronomy, University of San Francisco, San Francisco, CA, United States*);
Venkatesan, Aparna (*Physics and Astronomy, University of San Francisco, San Francisco, CA, United States*);
Rosenberg, Jessica (*George Mason University, Fairfax, VA, United States*);
Salzer, John (*Indiana University, Bloomington, IN, United States*);
Gronke, Max (*UC Santa Barbara, Santa Barbara, CA, United States*);
Cannon, John M. (*Macalester College, Saint Paul, MN, United States*);
Janowiecki, Steven (*University of Texas Austin, Austin, TX, United States*)

The escape of radiation from galaxies is a frontier cosmology problem with wide-ranging implications for reionization, galaxy evolution and detection strategies for high-redshift systems. Low- and intermediate-mass galaxies may have played a crucial role in reionization at early times, and by studying their analogues in the local universe, we can test models of radiation escape in galaxies that are more observationally accessible. We present here our cross-sectional analyses of the characteristics of low-redshift galaxies from surveys including KISSR, LARS, and two Green Pea galaxy samples through various computational and visualization techniques. Local systems with measured high (> 0.1) Lyman-alpha escape fractions tend to have high equivalent widths in H-alpha (EWHA) and low Lyman-alpha red-peak velocity. The KISSR systems contain a population, in appearance resembling "purple peas", with potentially steep UV slopes and high EWHA (please see accompanying poster by Olivieri Villalvazo et al. at this meeting). These might represent a population of local starforming galaxies that are more common than, e.g., Green Pea galaxies, that also have potentially high Lyman-alpha, and likely Lyman-continuum, escape. These galaxies could potentially test theoretical models and advance studies of the "first-light" galaxies anticipated from the James Webb Space Telescope through characterizing the underlying physical properties that contribute to radiation leakage. This work was supported by the University of San Francisco (USF) Faculty Development Fund, the USF Student Travel Fund, and by the Undergraduate ALFALFA Team through NSF grant AST-1637339.

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