X20a EMUS: the ionized circumgalactic medium of extremely metal-poor galaxies

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Local starburst dwarf galaxies, particularly extremely metal-poor galaxies (EMPGs), defined as having metallicities of $Z \leq 0.1\ Z_{\odot}$, are ideal laboratories to study feedback effects due to their shallow gravitational potentials and hard ionizing spectra. Simulations predict that such galaxies exhibit galactic-scale outflows that ionize the surrounding circumgalactic medium (CGM), which could be escape channels of LyC photons (e.g., Fujita et al. 2003; Wise et al. 2012). However, the phenomena and mechanisms have not yet been observationally confirmed or fully understood. To date, only one EMPG has had its ionized CGM mapped with wide-field integral field spectroscopy using MUSE (SBS 0335-52E; Herenz et al. 2017, 2023). Recently, we launched the "EMUS (EMPG MUSE)" project to investigate the ionized CGM and outflows of starburst EMPGs (X32a in ASJ2024b). Our main sample consists of 10 EMPGs at $z = 0.008$ to 0.04 in the literature (e.g., Nakajima et al. 2022), where MUSE's FoV size of 1' corresponds to 10 to 50 kpc^2. Among them, eight sources were observed with MUSE (1 to 2 hours/target; P110.23S1, 111.24HB). Deep archive data are available for the remaining two sources, including J1044+0353, whose extended Hα emission (Hα halo) has been investigated as a pilot study (Herenz, Kusakabe, and Soumil 2025; X09a in ASJ2025b). In this talk, we will focus on the analysis of the brightest Hα emission on the CGM scale. The surface brightness profiles of Hα emission are confirmed to be more extended than those of the continuum for all 10 sources, although prominent Hα halos like SBS 0335-52E and J1044+0353 are rare. We will also present the kinematics map of Hα emission.