our sample have Hdelta absorption line profiles that extend well beyond the central kpc. Most interestingly, we found a negative correlation between the Hdelta gradient slopes and the fractions of the stellar mass produced during the starburst, suggesting that stronger starbursts are more centrally-concentrated. I will discuss the results in relation with the origin of PSBs.

[석 GC-11] Properties of Merger-Driven Shocks in Clusters of Galaxies

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Shock waves have been observed in the outskirts of galaxy clusters. They are commonly interpreted as being driven by mergers of sub-clumps, so are called "merger shocks". We here report a study of the properties of merger shocks in merging galaxy clusters with cosmological hydrodynamic simulations. As a representative case, we describe the case where sub-clusters with mass ratio ~ 2 go through an almost head-on, binary-like merger. Because of the turbulent nature of hierarchical clustering, shock surfaces are not uniform, but composed of parts with different Mach numbers. As merger shocks expand from the core to the outskirts, the average Mach number, $< M_s >$, increases. The shocks propagating along the merger axis could be observed as X-ray shocks and/or radio relics. The kinetic energy through the shocks peaks at ~ 1 Gyr after shock launching, or at ~ 1 - 2 Mpc from the core. The most energetic shocks are found to have the kinetic-energy weighted Mach number, $< M_s >_{\phi} \simeq 2-3$, and the CR-energy weighted Mach number, $< M_s >_{CR} \simeq 3-4$. We then discuss the observational implications of our results.

[구 GC-12] Magnetic fields in clusters of galaxies

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Magnetic fields in clusters of galaxies play a critical role in shaping up the intracluster medium. Their existence has been established through observations of synchrotron emission, especially from radio relics and halos, as well as observations of rotation measure. In the so-called Sausage relic, which is one of Mpc-size giant radio relics detected in the outskirts of merging clusters, for instance, the magnetic fields are believed to have a few μG strength and a Mpc scale. The observed magnetic fields are conjectured to be produced by the process of small-scale turbulence dynamo. To investigate the dynamo origin, we simulate the development of turbulence and the follow-up amplification of magnetic fields in galaxy clusters using a three-dimensional magnetohydrodynamical(MHD) code. Turbulence is induced in highly stratified backgrounds expected in clusters, and driven sporadically mimicking major mergers. We here present preliminary results, aiming to answer whether the turbulence dynamo scenario can explain observed magnetic fields in clusters of galaxies.

[구 GC-13] Statistical Moment Analysis of the Strong DLA Profiles

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Incorporating the fully quantum mechanical computation of scattering cross-section and statistical moment analysis of absorption profiles, we investigate the Lyman line asymmetry of extremely high column density systems. Recent high redshift observations detected strong damped Lyman alpha systems (DLAs) whose column density is larger than N_HI ~ 〚10〛^21.3 cm^(-2). Absorption profiles of these DLAs are characterized by the broad and asymmetric damping wing. For accurate description of radiation damping, the second-order time-dependent perturbation theory is adopted. To quantitatively address line asymmetry, we define a distribution function for each Lyman line, and compute statistical moments (mean, standard deviation, skewness and kurtosis) regarding column densities N_HI > 〚10〛^18 cm^(-2). In this work, we present statistical properties of the intrinsic line profiles, and compare them with the Lorentzian cases.

[구 GC-14] Revealing the Powering Mechanism of Lyman Alpha Blob via Polarization

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