Mass inflow history of satellite halos around a dwarf galaxy

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• We aim to investigate **mass inflow history of satellite systems around three different dwarf galaxy** in a cosmological context by high-resolution hydrodynamic zoom simulation.

• We aim to show how mass inflow history of halos are affected by **evolutionary path, stellar feedback, interaction with other halos and also different kinematics**.

**Code**

• We modified GADGET-3 to include various baryonic physics (Springel 2005; Shin et al. 2014).
  - **Radiative Heating & Cooling** (Ferland et al. 1998)
  - **Reionization** at $z_{\text{reion}} = 8.9$ (Haardt & Madau 1996)
  - **UV Shielding** ($n_H \geq 0.014 \text{cm}^{-3}$) (Sawala et al. 2010)
  - **Star formation** (Saitoh et al. 2008)
  - **Supernova feedback** (Okamoto et al. 2008)

**Resolution**

• Particles mass : DM: $4.17 \times 10^3 M_\odot$, Gas: $7.92 \times 10^2 M_\odot$
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**Mass inflow history**
- We measure how many *matters fall into the satellite halos per unit time* (= mass influx).

**Categorization of satellite halos**

**Type 1**
- Constant or increasing DM/gas mass influx during floating to the main halo
- 17 of 25 reside along the filamentary structures.

**Type 2**
- Constant or decreasing DM mass influx during floating to the main halo
- Interrupted or Decreasing gas mass influx during their evolution outside main halo
- 12 of 14 come from the field region.

The mean properties of halos of each type

<table>
<thead>
<tr>
<th></th>
<th>(M_{\text{tot}}(z=z_{\text{in}})) [M_☉]</th>
<th>Mass influx [M_☉/Myr]</th>
<th>(N_{\text{merger}})</th>
<th>Age((z&gt;z_{\text{in}})) [Myr]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>1.36e+08</td>
<td>9.04e+04</td>
<td>115</td>
<td>1,020</td>
</tr>
<tr>
<td>Type 2</td>
<td>6.98e+07</td>
<td>2.87e+04</td>
<td>76</td>
<td>2,238</td>
</tr>
</tbody>
</table>

→ **Growth process outside of the main halo is important to the evolution of the satellite halo.**
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**Type 1 halos**

Accumulated mass history

- Falling into the main halo
- Cosmic reionization

Mass inflow history

- By major merger
- By supernova feedback

**Type 2 halos**

Accumulated mass history

- Cosmic reionization

Mass inflow history

- By major merger
- By supernova feedback