## Dark MaGICC Effect of dark energy on galactic scales

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#### w(z)different background evolution

$$H(z) = H_0 \sqrt{\underbrace{\Omega_{m_0}(1+z)^3}_{\text{matter}} + \underbrace{\Omega_{r_0}(1+z)^4}_{\text{radiation}} + \Omega_{DE_0}}$$





#### DM only sims

small changes on galactic scales Ma et al. 1999 Bode et al. 2001 Klypin et al. 2003 Linder and Jenkins 2003 Dolag et al. 2004 Macciò 2005 Kuhlen et al. 2005

#### Hydro sims

Maio et al. 2006 Aghanim et al. 2009 De Boni et al. 2011&2012 Ma 2007 Francis et al. 2007 Casarini et al. 2009 Alimi et al. 2010 Fedeli et al. 2011

# MarGICC project



same feedback different dark energy





### Flattening rotation curves



#### Metal enrichment and gas cooling time



SUCDM	ACDM	waCDM2
0.0 Gyr	0.0 Gyr	0.0 Gyr

## conclusions

 dark energy \*does\* matter even on galactic scales



- baryons enhance differences in dark energy models

 feedback as key ingredient to make realistic galaxies, but details in the feedback modelling are as important as DE properties