Example feedback scheme (Dutton 2009 MNRAS, 395, 121)

Supernova drives outflows, which are assumed to move at the local escape velocity to maximize mass removal. ($< V_{esc}$ doesn't escape; $> V_{esc}$ moves less mass for same energy)

Energy driven wind model:

$$\Delta M_{eject}(R) = \frac{2 \epsilon_{EFB} \eta_{SN} E_{SN} \Delta M_*(R)}{V_{esc}^2(R)}$$

$\Delta M_{eject}$: ejected mass from radius R

$\Delta M_*(R)$: mass of stars formed at radius R

$E_{SN} \simeq 10^{51}$ erg $= 5 \times 10^{7}$ km$^2$ s$^{-2}$ $M_\odot$

$\eta_{SN} = 8.3 \times 10^{-3}$ # SN per $M_\odot$ of stars formed (this # for a Chabrier IMF)

$\epsilon_{EFB}$ = fraction of kinetic energy injected into wind

Usually a large # in simulations (0.25 - 1)

usually a small # observed (0.02 - 0.1)

Momentum driven wind model

$$\Delta M_{eject}(R) = \frac{\epsilon_{MFB} p_{SN} \eta_{SN} \Delta M_*(R)}{V_{esc}(R)}$$

$p_{SN} = 3 \times 10^{4}$ $M_\odot$ km s$^{-1}$ is momentum produced by one SN

$\epsilon_{MFB}$ is again the coupling efficiency to the ISM

This formulation maximizes the impact of SN.