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A recipe for using binary stellar yields in galactic chemical evolution calculations

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Galactic chemical evolution calculations provide invaluable feedback between abundance surveys and stellar and nuclear physics models. Until recently, only yields from single stars have been available, so chemical evolution codes do not have the capability to build a mixed population of binary and single stars. This is a serious limitation, as most stars –particularly the most massive –form in binaries, and follow different evolution pathways that affect their yields. In this talk, we present our framework for calculating 'effective binary stellar yields'which account for the evolution of both the primary and the secondary stars. These effective binary yields can be included in existing chemical evolution codes as if they were single stellar yields. We provide a checklist of the outputs from binary stellar models that are required to fully exploit binary stellar yield calculations of stable and radioactive isotopes. We also present our results on how assumptions around the mass transfer efficiency and birth distributions –including the binary mass fraction –affect the binary stellar yields and lifetimes.

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