Title:	Interacting galaxies in the IllustrisTNG simulations – II: star formation in the post-merger stage
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Abstract:	Galaxy mergers are a major evolutionary transformation whose effects are borne out by a plethora of observations and numerical simulations. However, most previous simulations have used idealized, isolated, binary mergers and there has not been significant progress on studying statistical samples of galaxy mergers in large cosmological simulations. We present a sample of 27 691 post-merger (PM) galaxies (0c ≤ z ≤ 1) identified from IllustrisTNG: a cosmological, large box, magnetohydrodynamical simulation suite. The PM sample spans a wide range of merger and galaxy properties (M⋆, μ, fgas). We demonstrate that star-forming (SF) PMs exhibit enhanced star formation rates (SFRs) on average by a factor of ~2, while the passive PMs show no statistical enhancement. We find that the SFR enhancements: (1) show no dependence on redshift, (2) anticorrelate with the PM's stellar mass, and (3) correlate with the gas fraction of the PM's progenitors. However, SF PMs show stronger enhancements which may indicate other processes being at play (e.g. gas phase, feedback efficiency). Although the SFR enhancement correlates mildly with the merger mass ratio, the more abundant minor mergers (0.1 ≤ μ < 0.3) still contribute ~50 per cent of the total SFR enhancement. By tracing the PM sample forward in time, we find that galaxy mergers can drive significant SFR enhancements which decay over ~0.5 Gyr independent of the merger mass ratio, although the decay time-scale is dependent on the simulation resolution. The strongest merger-driven starburst galaxies evolve to be passive/quenched on faster time-scales than their controls.
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