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Upper limits on the rates of BNS and NSBH mergers from Advanced LIGO's first observing run BENJAMIN LACKEY, Albert Einstein Institute - Potsdam, LIGO SCIENTIFIC COLLABORATION, VIRGO COLLABORATION COLLABORATION — Last year the Advanced LIGO detectors finished their first observing run and detected two binary black hole mergers with high significance but no binary neutron star (BNS) or neutron-star–black-hole (NSBH) mergers. We present upper limits on the rates of BNS and NSBH mergers in the universe based on their non-detection with two modeled searches. With zero detections, the upper limits depend on the choice of prior, but we find 90% upper limits using a conservative prior of $12,000/Gpc^3/yr$ for BNS mergers and $1,000 - -3,000/Gpc^3/yr$ for NSBH mergers depending on the black hole mass. Comparing these upper limits to several rates predictions in the literature, we find our upper limits are close to the more optimistic rates estimates. Further non-detections in the second and third observing runs should be able to rule out several rates predictions. Using the observed rate of short gamma ray bursts (GRBs), we can also place lower limits on the average beaming angle of short GRBs. Assuming all short GRBs come from BNS mergers, we find a 90% lower limit of 1–4 degrees on the GRB beaming angle, with the range coming from the uncertainty in short GRB rates.

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