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No Detectable Kilonova Counterpart is expected for O3 neutron star-black hole candidates

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As the new era of GW-led multi-messenger astronomy is ushered in, one may especially expect to catch GW signals from neutron star-black hole (NSBH) mergers and search for associated as-yet undiscovered NSBH kilonova emissions. However, in spite of many efforts for follow-up searches of potential NSBH candidates during the third run (O3) of LIGO/Virgo Collaboration (LVC), no surely EM counterpart candidate was identified. In this talk, I will show our simulated NSBH kilonova luminosity function based on our NSBH kilonova models and analyze the detectability of kilonova emissions from cosmological NSBH populations for present and future follow-up telescopes. Furthermore, I will analyze the tidal disruption probability of potential NSBH merger GW events detected during the O3 of LVC and the detectability of kilonova emissions in connection with these events. Plausible explanations for the lack of NSBH associated kilonova detection during O3 will be given.

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