Contribution ID: **41** Type: **not specified**

Quintessence with a sudden transitional feature and its late-time cosmological signals

Wednesday, 18 February 2026 10:40 (20 minutes)

Combinations of recent cosmological observations, including Dark Energy Spectroscopic Instrument, show hints of a dynamical nature for dark energy. While the data suggest the possibility of the phantom crossing, it is worth exploring thoroughly quintessence models. As phenomenological parametrizations of the equation-of-state parameter $w(a)$ with a sharp transitional feature fit the data well, we study the realization of such models by quintessence. In the late Universe, the quintessence field begins to oscillate abruptly, changing the behavior of w. Naturally, such a model entails tachyonic instability, and particle production modifies w. We perform numerical lattice simulations to study the time dependence of w. In addition, the violent particle production produces significant density perturbations and the stochastic gravitational-wave background, whose characteristic scale depends on the mass scale of the quintessence around the minimum of the potential.
We discuss the observability of these late-time cosmological signals through cosmic microwave background, quasar astrometry, pulsar timing arrays, and others.

Presenter: TERADA, Takahiro

Session Classification: parallel session B: Cosmo