

- $P^+ = \sum_i p_i^+$, $p_i^+ > 0$: LF vacuum is the state with $P^+ = 0$ and contains no particles: all other states have $P^+ > 0$ (usual vacuum bubbles are kinematically forbidden in the front form !)
- Frame independent definition of the vacuum within the causal horizon

$$P^2|0\rangle = 0$$

(LF vacuum also has zero quantum numbers and $P^+ = 0$)

- LF vacuum is defined at fixed LF time $x^+ = x^0 + x^3$ over all $x^- = x^0 - x^3$ and \mathbf{x}_\perp , the expanse of space that can be observed within the speed of light
- Causality is maintained since LF vacuum only requires information within the causal horizon
- The front form is a natural basis for cosmology: universe observed along the front of a light wave

