This movie shows the development of the spectrum of a the previous self-phase modulating pulse. The pulse is a Gaussian $e^{-(t)^2}$. The phase grows linearly with distance (and thus as time evolves in the movie) to a peak value of $7\pi$.

For a mode-locked laser the spectrum would be discrete with a frequency separation of $\frac{c}{2\pi L} + \delta$ where $L$ is the cavity length and $\delta$ is known as the carrier slippage.