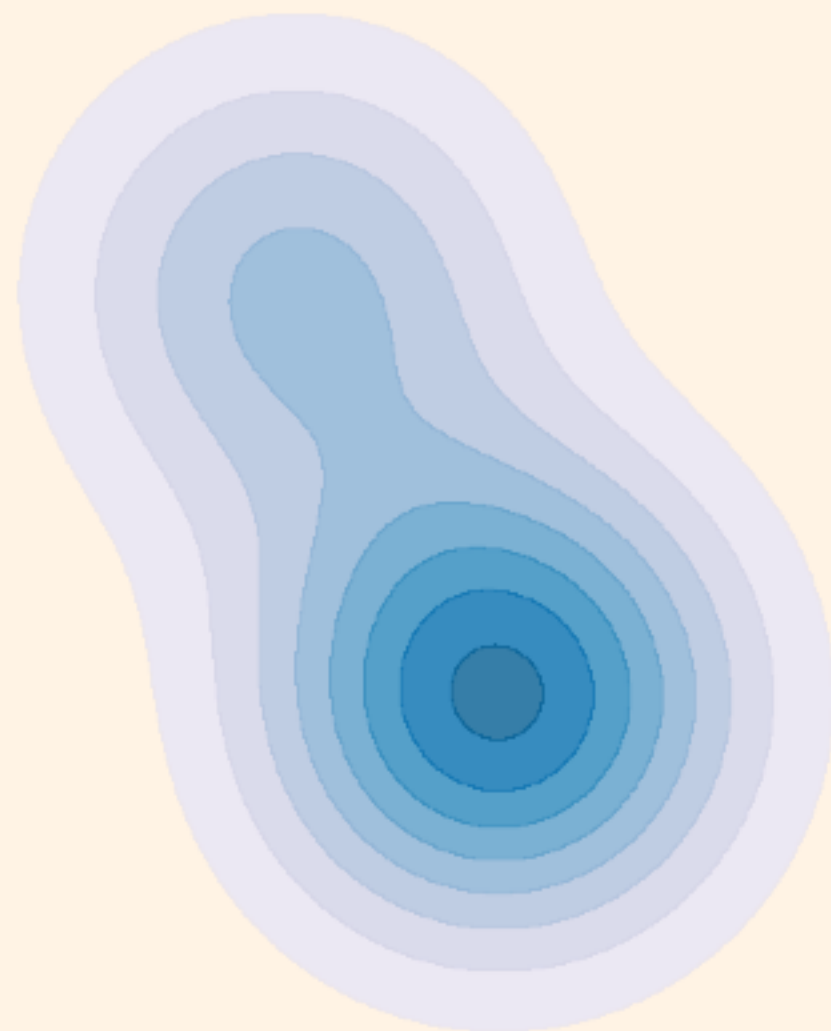
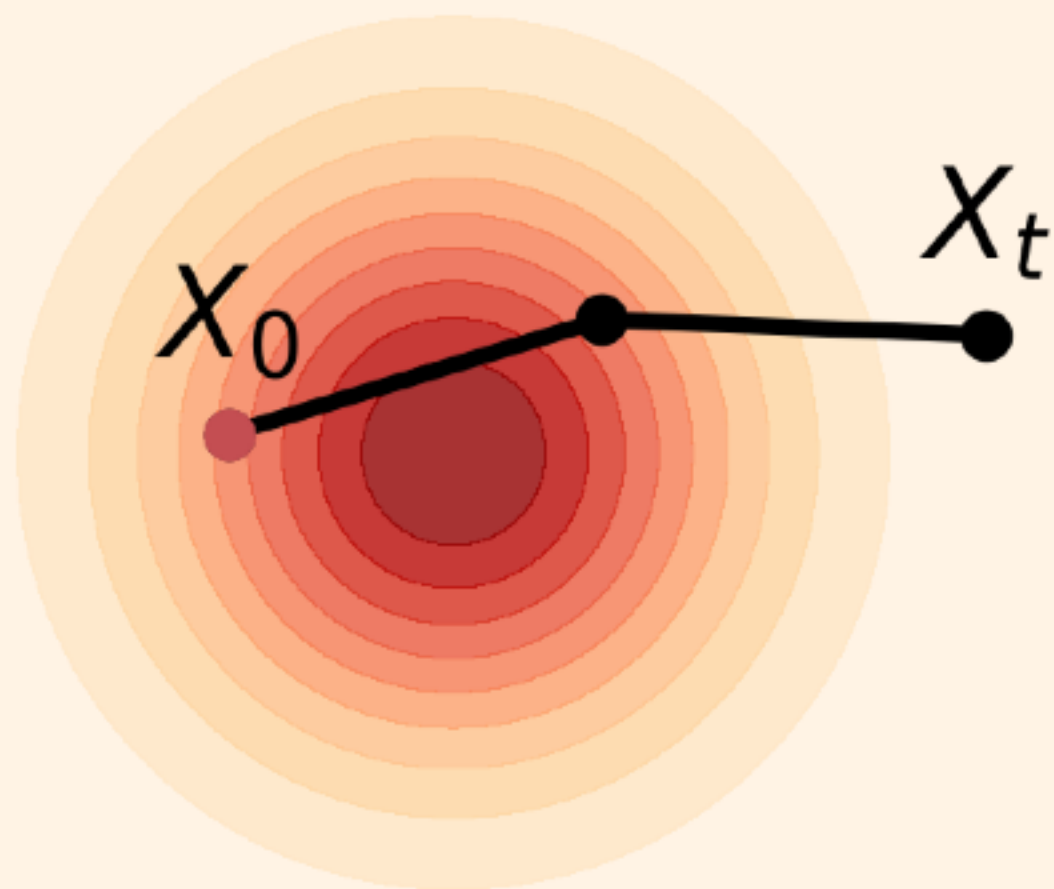
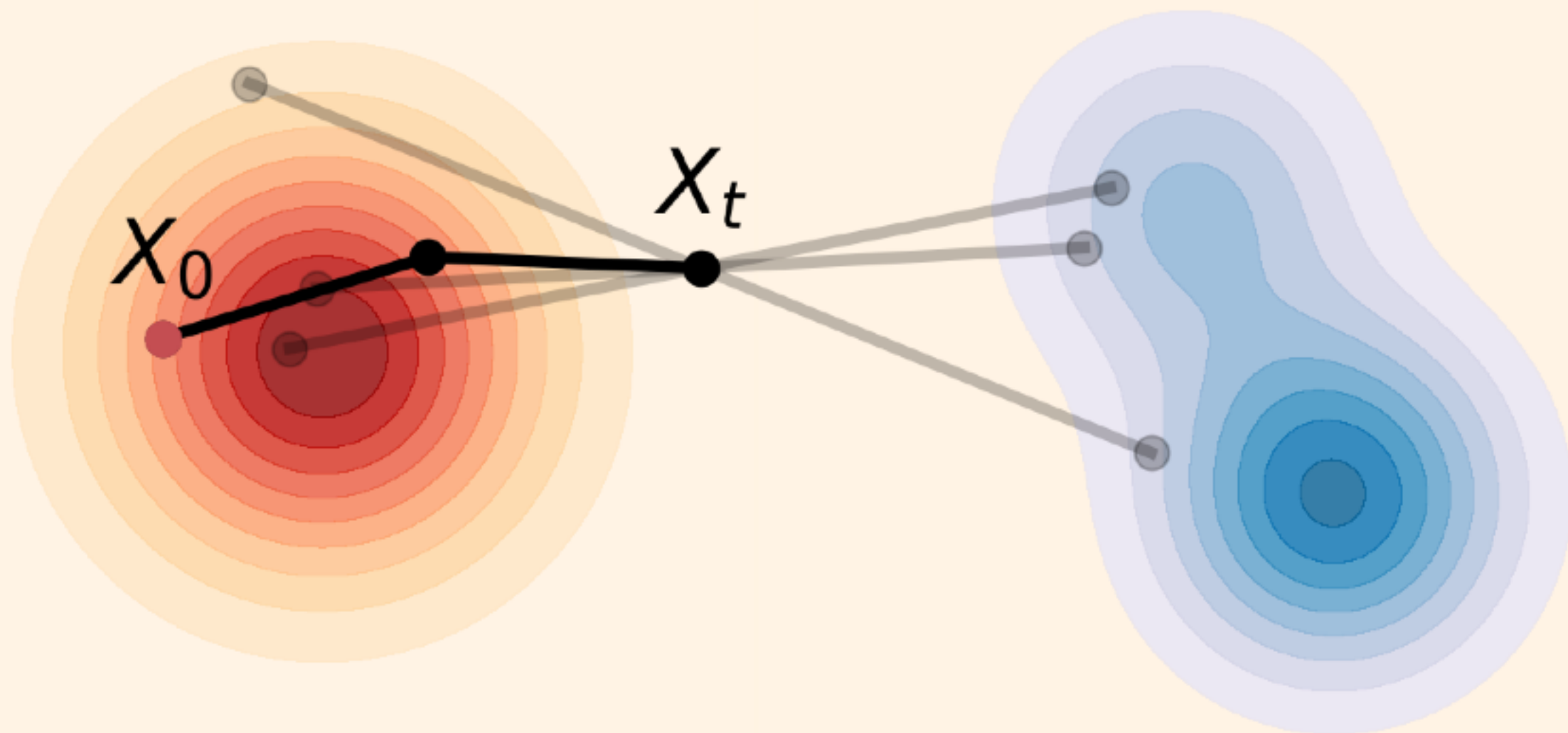
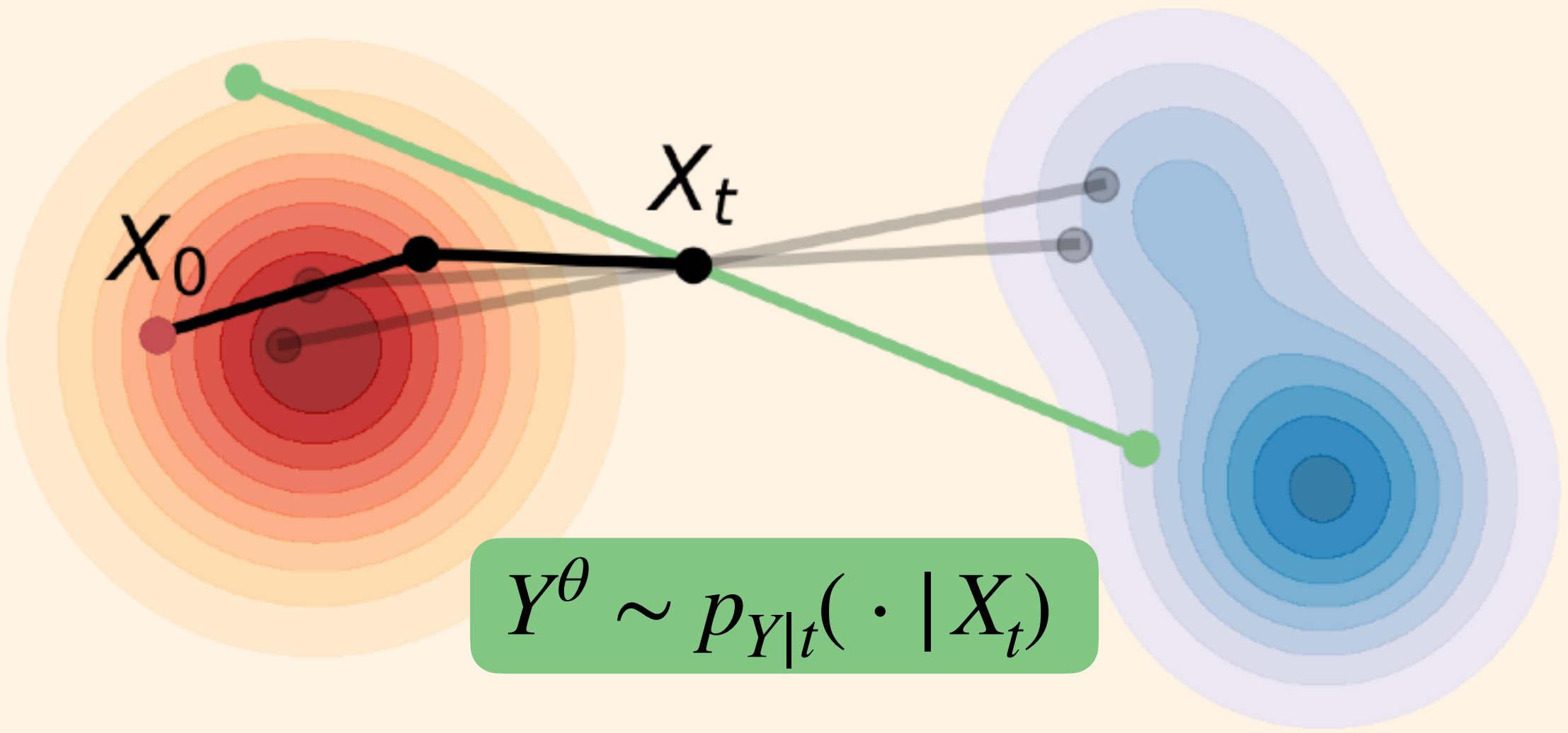




**DTM vs. FEM**



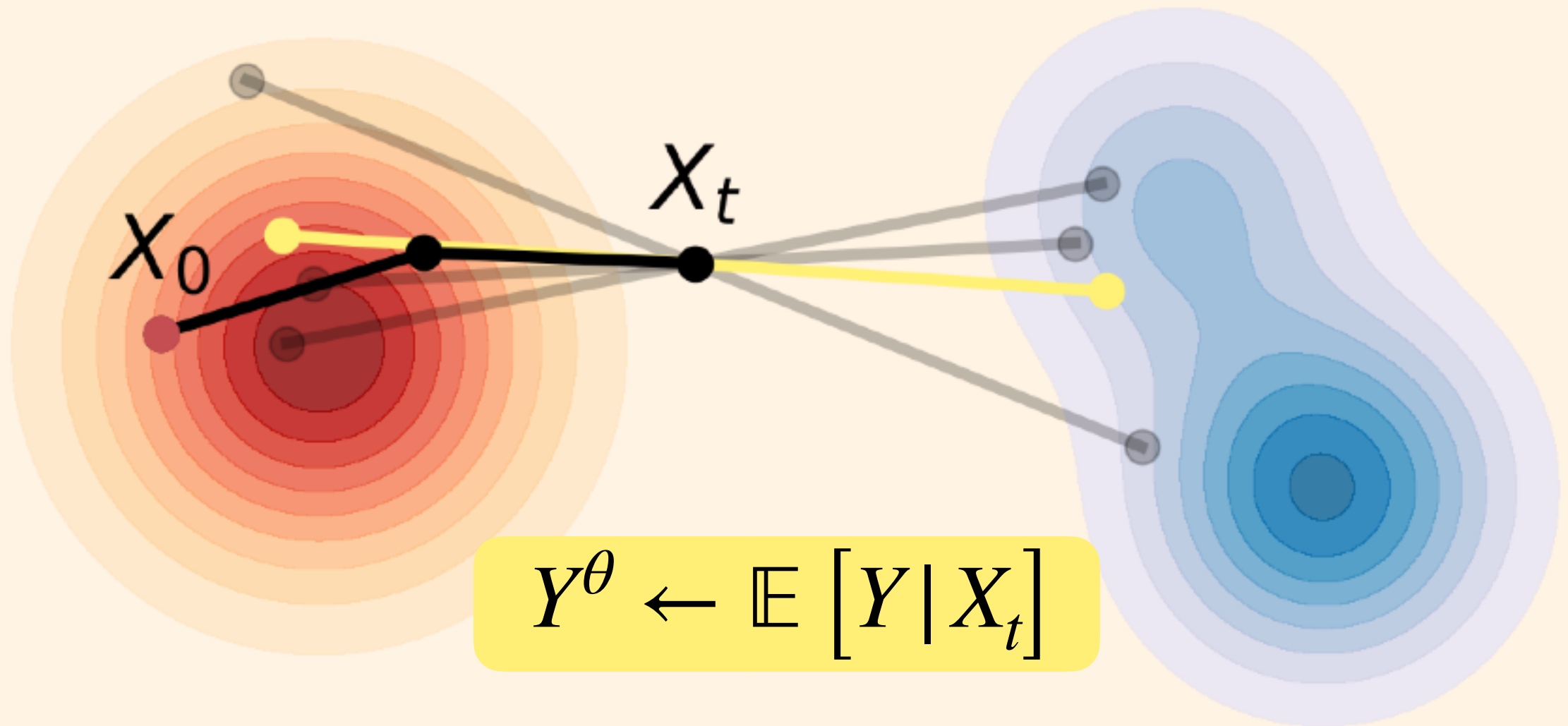




The diagram illustrates a Markov Chain Monte Carlo (MCMC) process. It features two contour plots: a red one on the left and a blue one on the right. A black line represents a sequence of states, starting at a red dot labeled  $X_0$  and ending at a black dot labeled  $X_t$ . From  $X_t$ , two green lines branch out to green dots in the blue contour plot, representing a new state  $Y^\theta$ . Two grey lines also originate from  $X_t$  and point to grey dots within the blue contour plot. A green rounded rectangle at the bottom contains the mathematical expression for the proposal distribution.

$$Y^\theta \sim p_{Y|t}(\cdot | X_t)$$

# FM



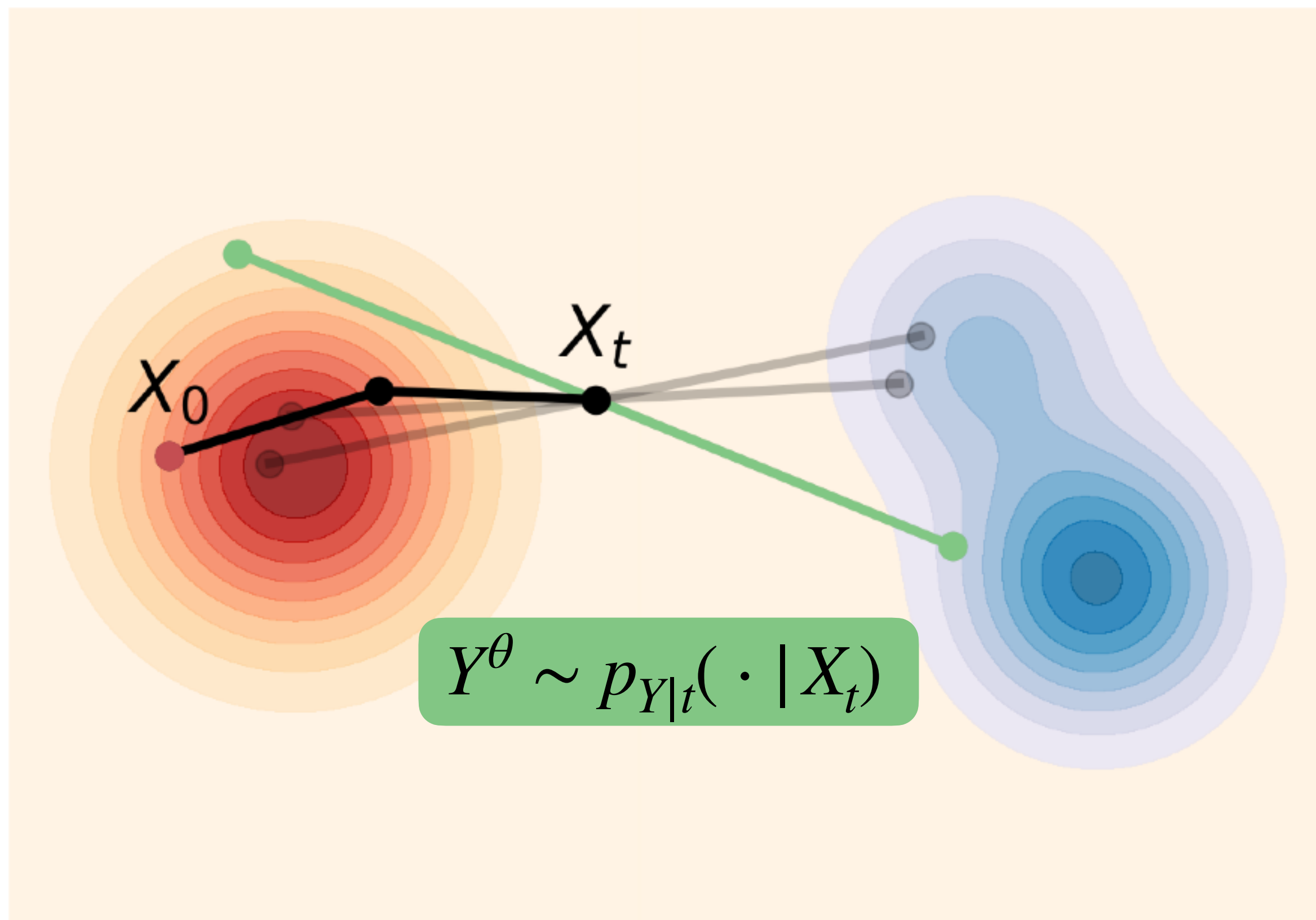
**D**

**T**

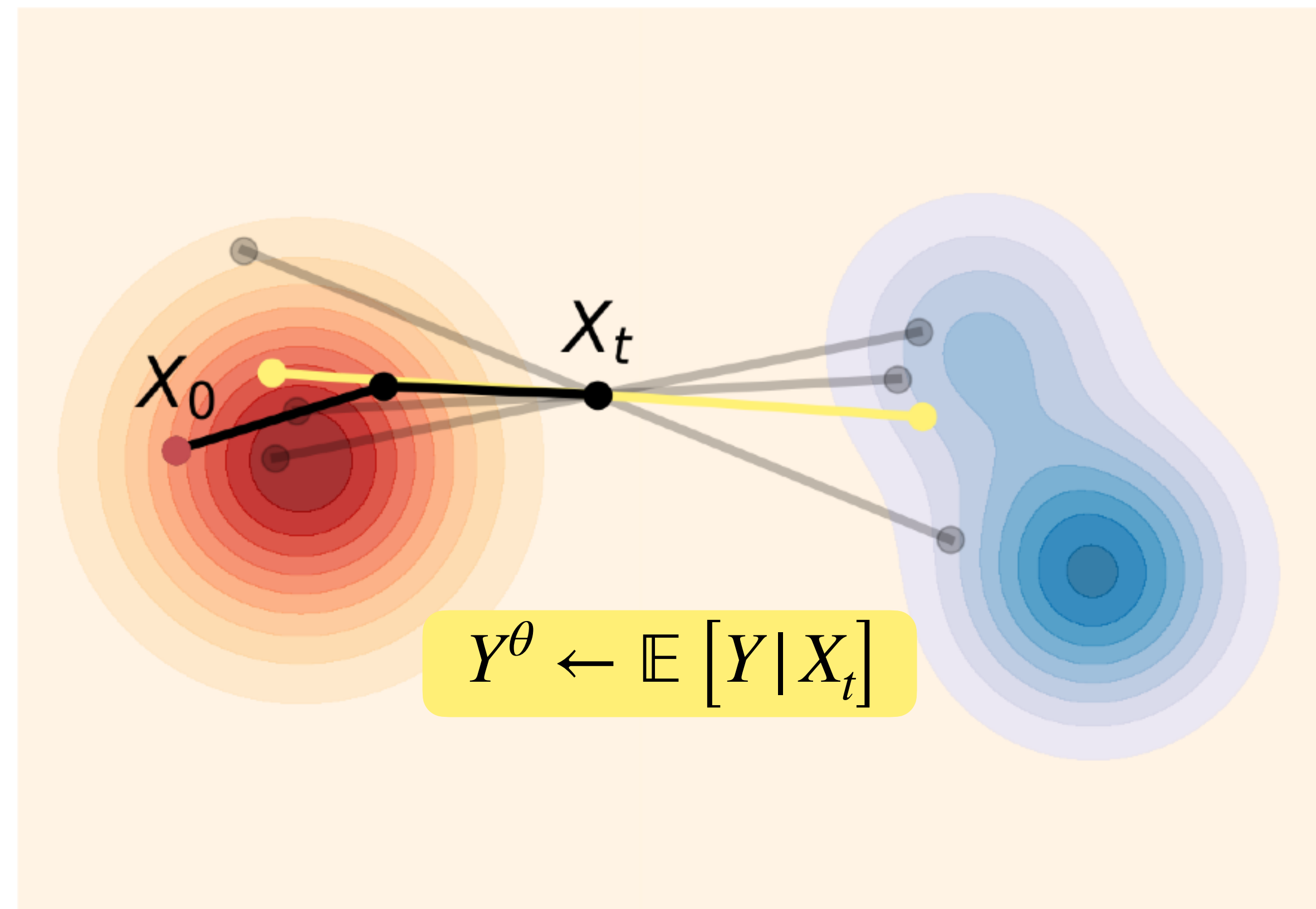
**M**

# DTM vs. FM

## DTM

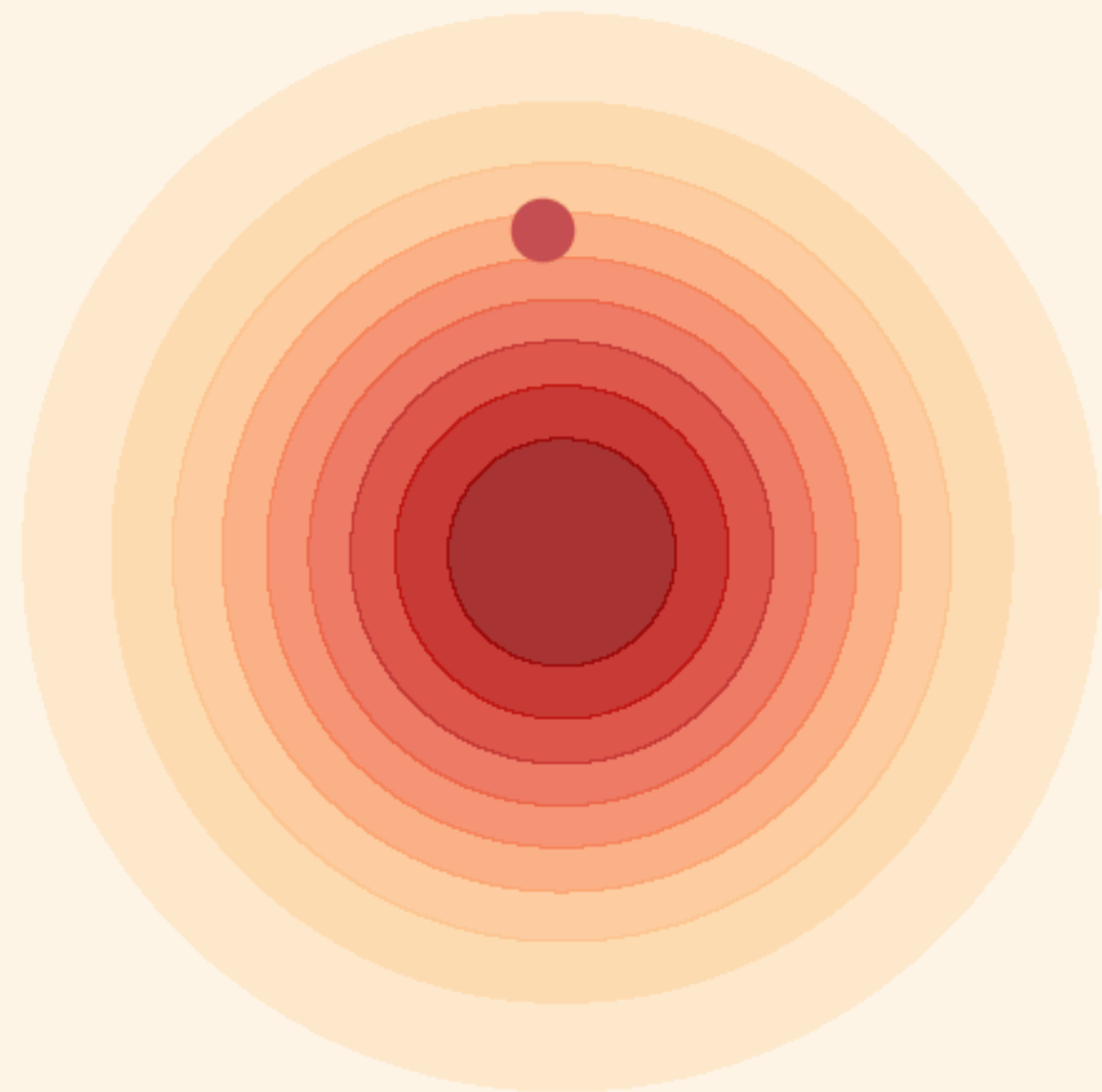


## FM

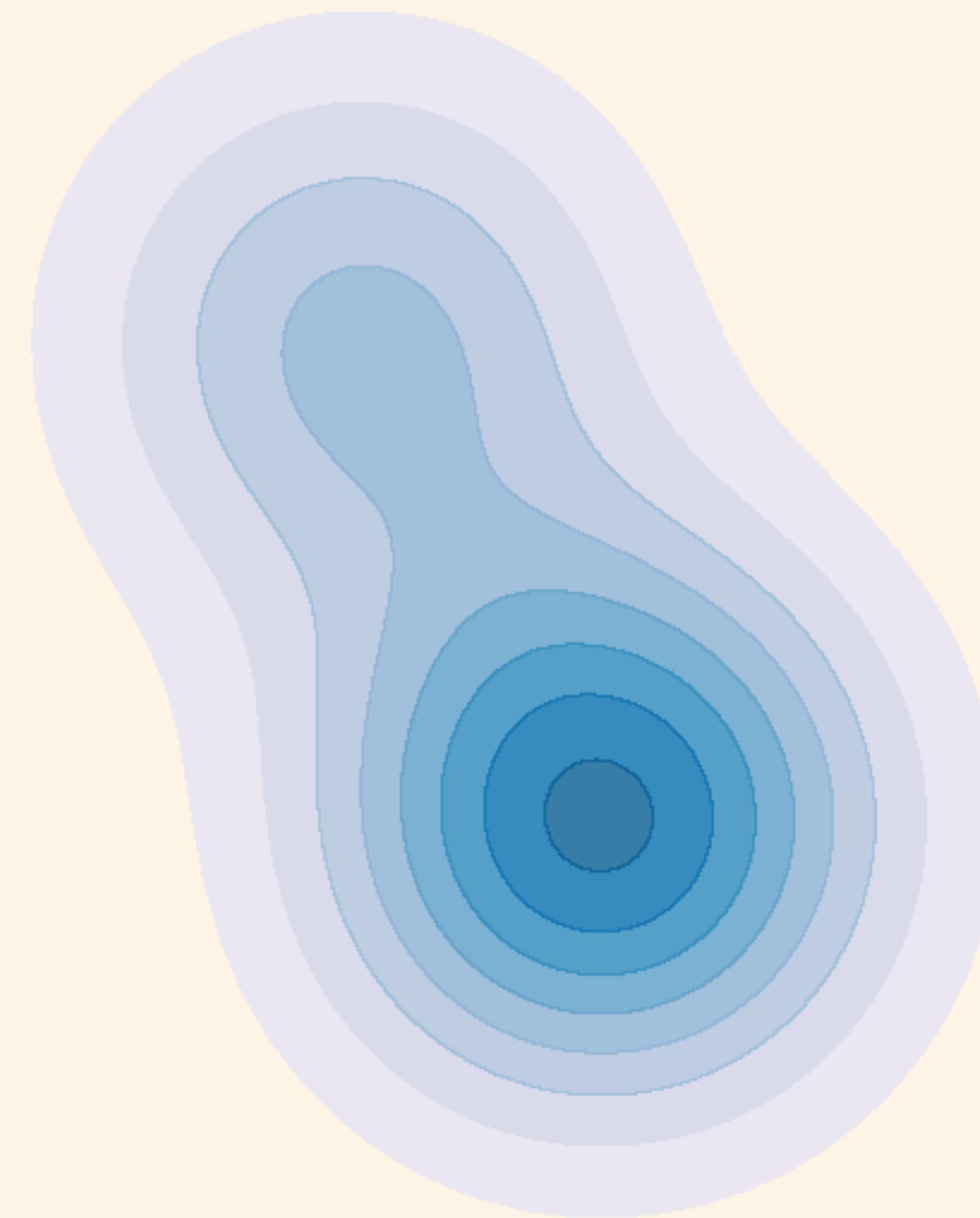




# DTM vs. FM



— DTM: 2-steps  
— FM



**Theorem 1:** (informal) As the number of steps increases,  $T \rightarrow \infty$ , DTM converges to Euler step FM. Given a state  $X_t = x_t$ ,

$$X_{t+k} \approx x_t + \frac{k}{T} \mathbb{E} [X_T - X_0 | X_t = x_t], \quad \text{as } k/T \rightarrow 0, k \rightarrow \infty.$$