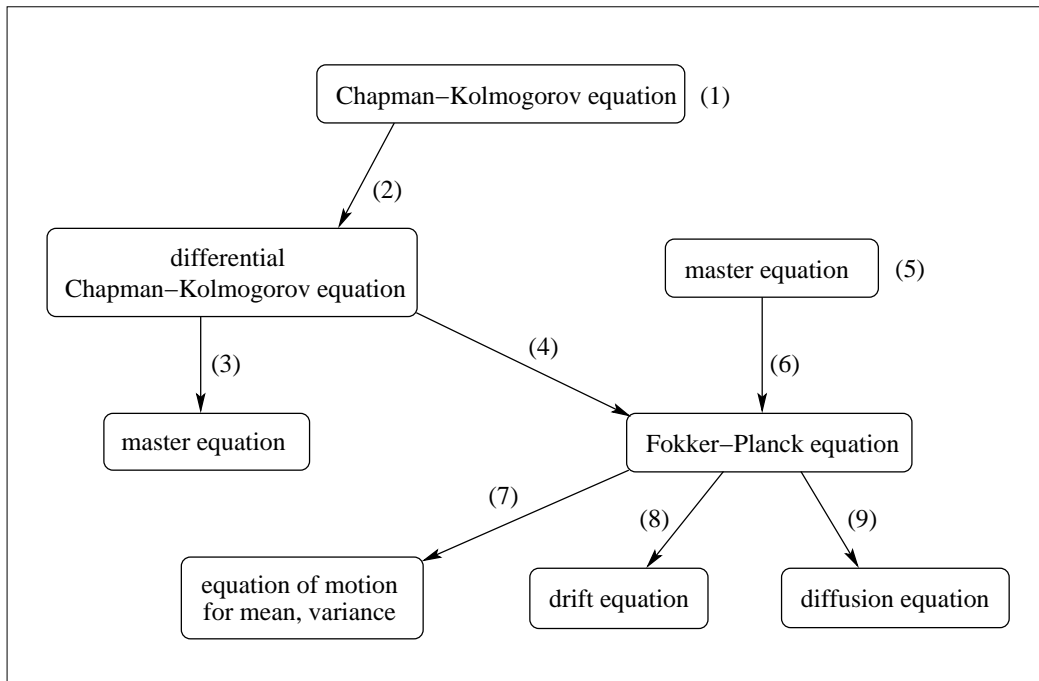


Markov processes: map of specifications [mln16]



- (1) Chapman-Kolmogorov equation imposes restrictions on permissible functions $P(x, t|x_0)$ but does not suggest a classification of processes.
- (2) Particular solutions that are specified by
 - $A(x, t)$ describing drift,
 - $B(x, t)$ describing diffusion,
 - $W(x|x'; t)$ describing jumps.
- (3) Jump processes exclusively.
- (4) Processes with continuous sample paths, satisfying Lindeberg criterion (drift and diffusion, no jumps).
- (5) Master equation with any $W(x|x'; t)$ specifies a Markov process. Natural starting point for processes with discrete stochastic variables.
- (6) Transition rates $W(x|x'; t)$ of master equation approximated by two jump moments provided they exist. Approximation captures drift and diffusion parts (on some scale).
- (7) Drift and diffusion determine mean $\langle\langle x \rangle\rangle$ and variance $\langle\langle x^2 \rangle\rangle$ via equations of motion for jump moments.
- (8) Deterministic process have no diffusive part: $B(x, t) = 0$.
- (9) Purely diffusive processes have no drift: $A(x, t) = 0$.