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Data-driven discovery of physical laws is a grand challenge in many science and engineering research areas, and many fundamental laws are formulated in the form of differential equations. We propose a new method capable of discovering the governing differential equations from data. Our method is based on Bayesian inference and uses a subsampling technique so that it is robust to noisy data. Numerical examples show that our new method is significantly better than the other model-discovering methods and traditional regression methods. The examples include predator-prey model, shallow water equations, heat diffusion, and fish-harvesting problem. (Received January 22, 2020)