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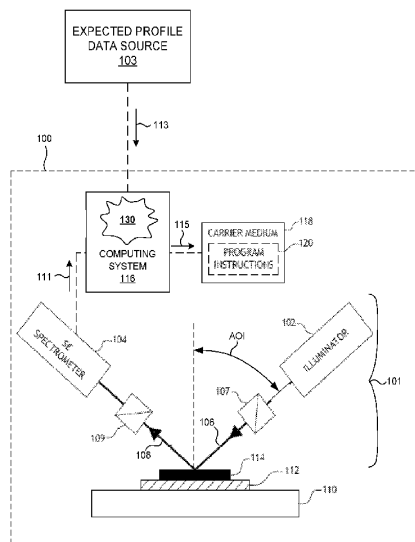


FIG. 1

(57) Abstract: Methods and systems for generating optimized geometric models of semiconductor structures parameterized by a set of variables in a latent mathematical space are presented herein. Reference shape profiles characterize the shape of a semiconductor structure of interest over a process space. A set of observable geometric variables describing the reference shape profiles is transformed to a set of latent variables. The number of latent variables is smaller than the number of observable geometric variables, thus the dimension of the parameter space employed to characterize the structure of interest is reduced. This dramatically reduces the mathematical dimension of the measurement problem to be solved. As a result, measurement model solutions involving regression are more robust, and training of machine learning based measurement models is simplified. Geometric models parameterized by a set of latent variables are useful for generating measurement models for optical metrology, x-ray metrology, and electron beam based metrology.

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