Field Optimization Algorithm for the Various Variably Polarization Undulator with Changing Phase, C.H. CHANG, T.C. FAN, C.S. HWANG, S. YEY, SRRC - The "Sasaki" type undulator can be used to switch of polarization from horizontal linear, to right/left circular and elliptical, to vertical linear, to linear at 45o and 135o. Therefore, a field optimization skill and algorithm can be used to optimize the field quality at various variably polarization operation mode. Such a optimization algorithm include that what is the crucial parameters need to be sorted of the magnet blocks and to be shimmed on each pole. This optimization algorithm can correct and modify the field error, the first integral field strength, optical phase error, the trajectories, and the multipole field distribution as soon as possible. For reducing the time consumption in the shimming process, the shimming process will be completed automatically by a shimming code. Consequently, the magnetic field and photon spectrum quality will be independent of the phase position in the different polarization mode.