4.3   Linear Least Squares

The general problem of a multi-dimensional minimization (i.e., finding the minimum of a real-valued function of several variables) is much too complex to be treated here. Therefore, as an example, we restrict ourselves to the case where an analytical solution exists for a multi-dimensional minimization problem: the linear least squares method. In general, "least squares" refers to an objective function being composed of squared differences between given data and a model that shall represent the given data. As a special case, a "linear least squares" problem refers to the case where (i) the model is described by a function depending linearly on some parameters and (ii) those values for these parameters shall be found that minimize the objective function, which means to obtain "least squares".