

2.5. Convergence Analysis in the Non-standard Case

2.5.1. Violation of the Variational Principle (Variational Crimes)

■ Standard Case (Variational Principle = Galerkin Principle)

$$(1) \text{ Find } u \in V_g: a(u, v) = \langle F, v \rangle \quad \forall v \in V_0 \subset V$$

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$$(1)_h \text{ Find } u_h \in V_{gh}: a(u_h, v_h) = \langle F, v_h \rangle \quad \forall v_h \in V_{0h} \subset V_h$$

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+ Standard Assumptions: 6

$$(33) \left\{ \begin{array}{l} 1) \quad F \in V_0^*, \\ 2) \quad a(\cdot, \cdot): V \times V \rightarrow \mathbb{R}^1 \sim \text{continuous b. f. :} \\ 2a) \quad a(v, v) \geq \mu_1 \|v\|^2 \quad \forall v \in V_0, \\ 2b) \quad |a(u, v)| \leq \mu_2 \|u\| \|v\| \quad \forall u, v \in V_0. \end{array} \right.$$