
Variational Methods for Engineers with Matlab®

Eduardo Souza de Cursi

Color Section

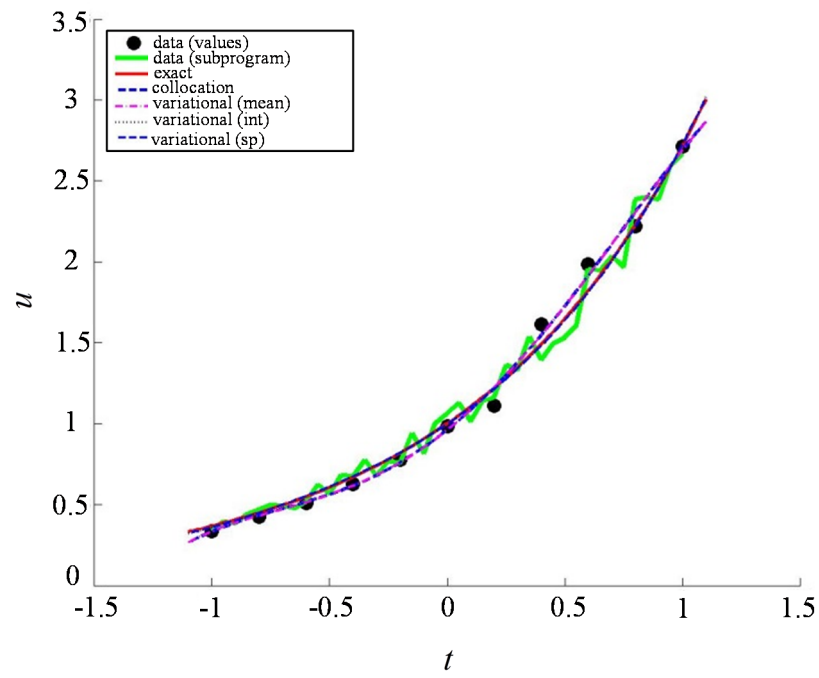


Figure 2.2. *Orthogonal projection in a simple noisy situation*

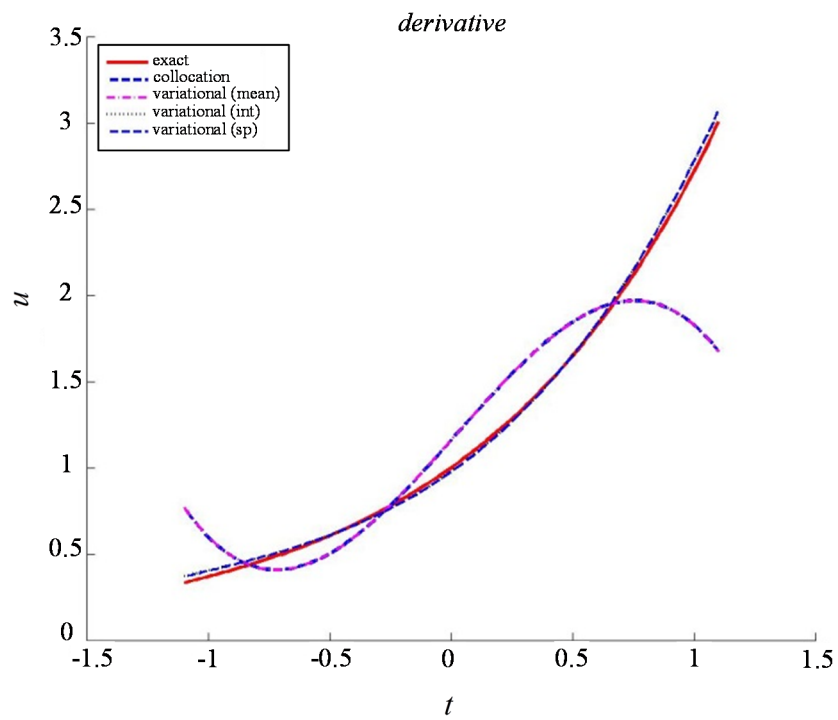


Figure 2.3. *Derivative in a simple noisy situation*

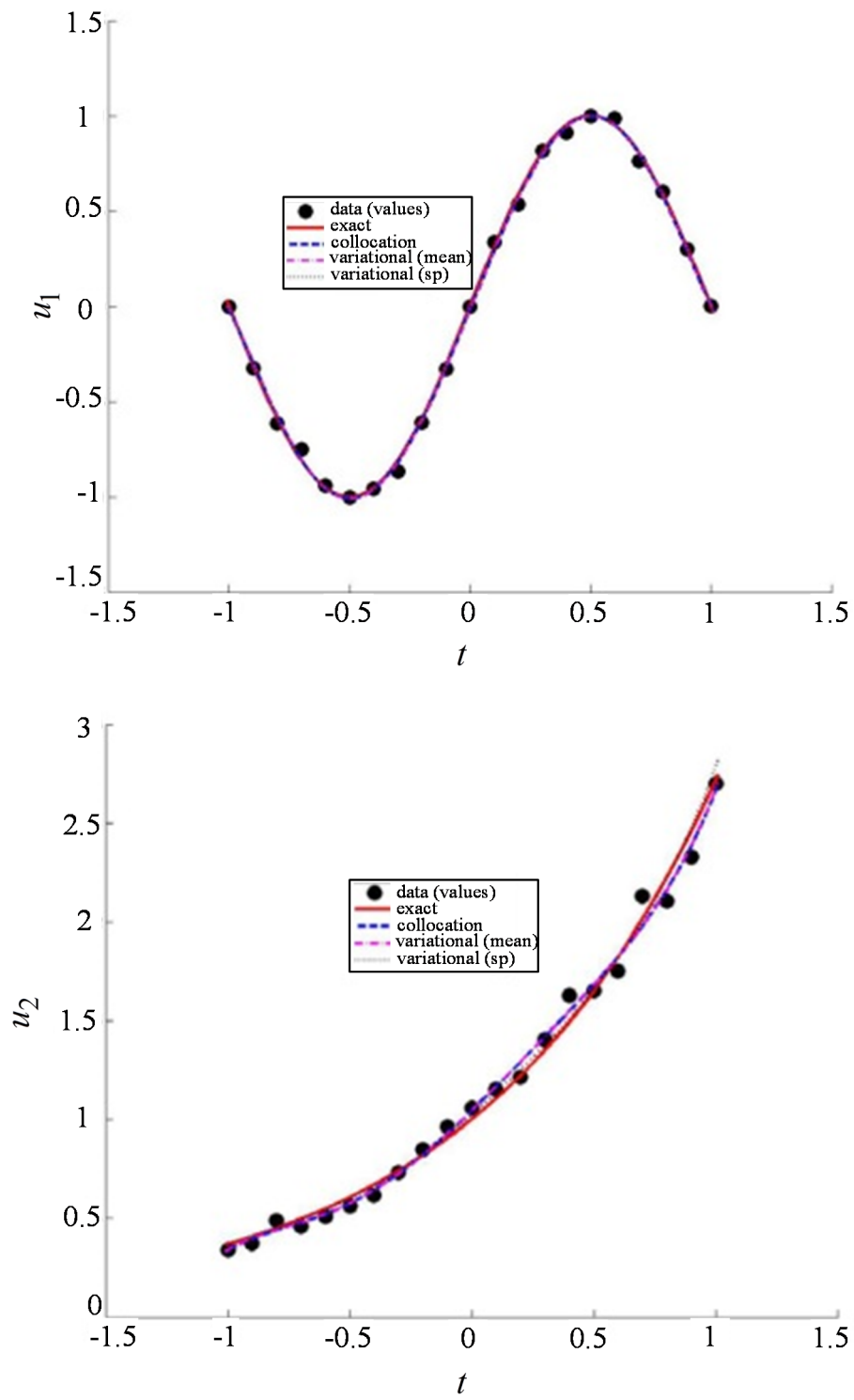


Figure 2.4. Orthogonal projection in a simple noisy situation

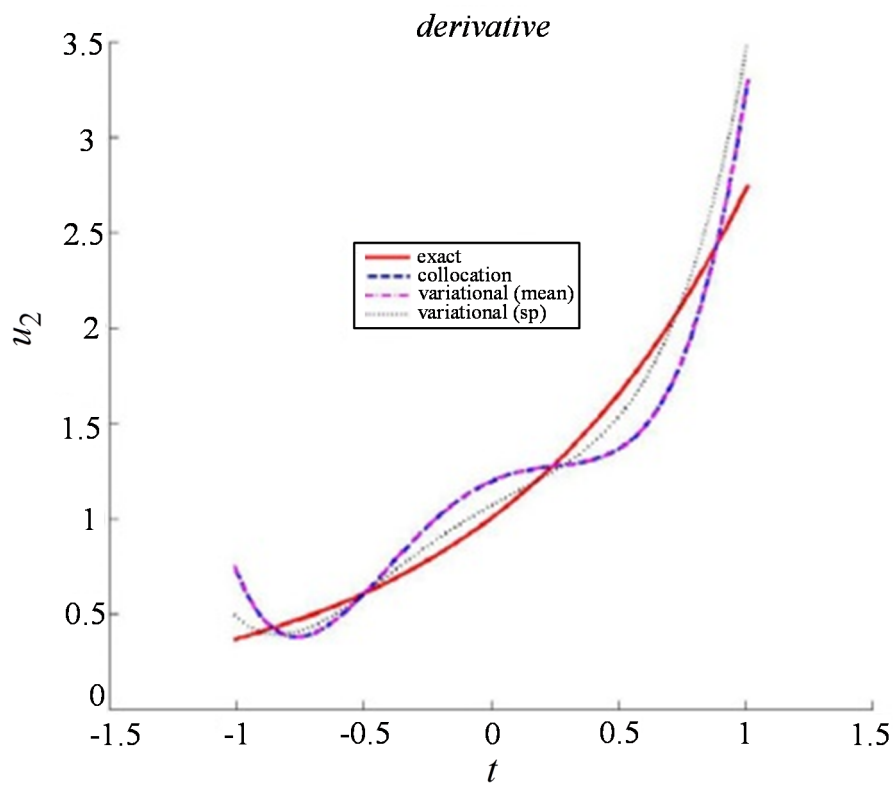
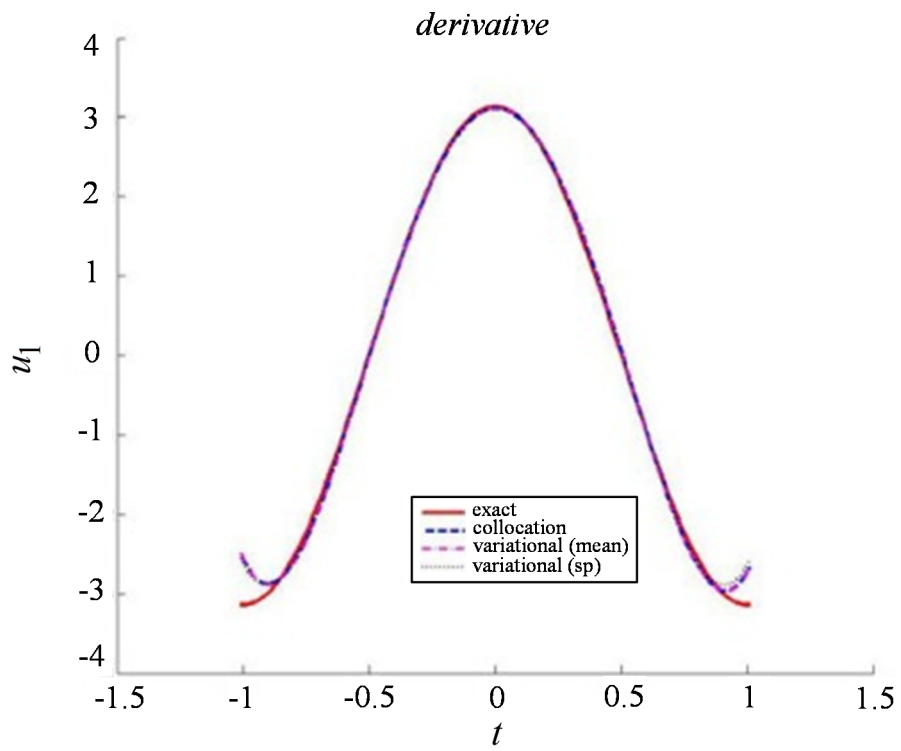


Figure 2.5. Derivative in a simple noisy situation

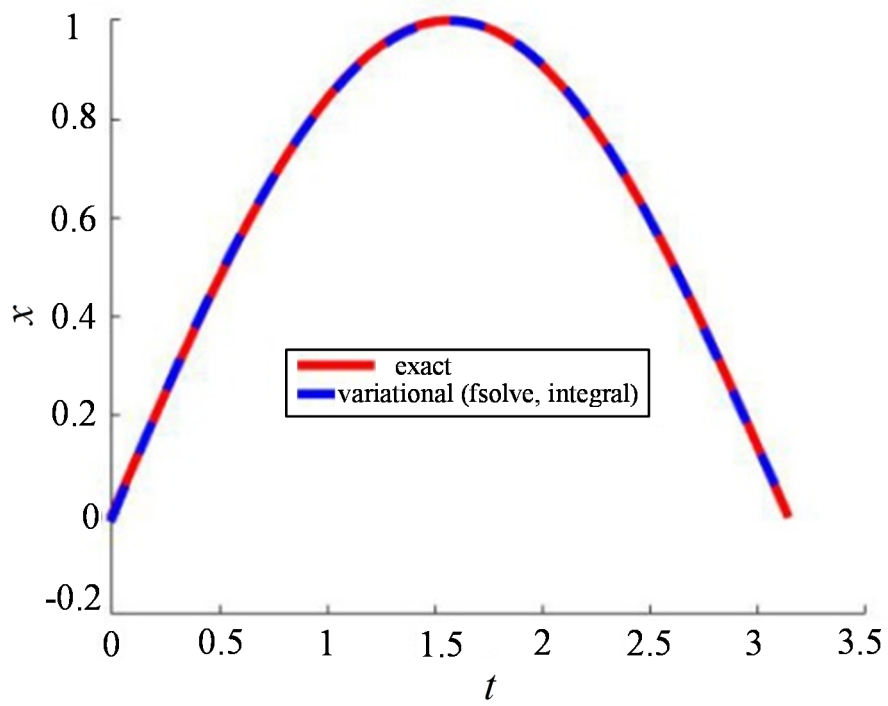
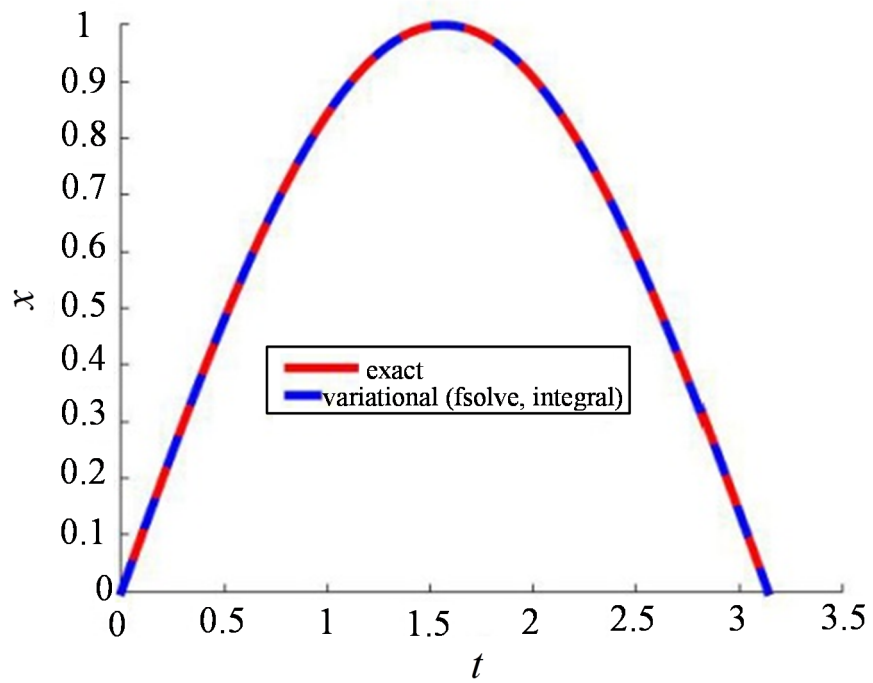


Figure 2.6. Solutions obtained for a polynomial of degree 6

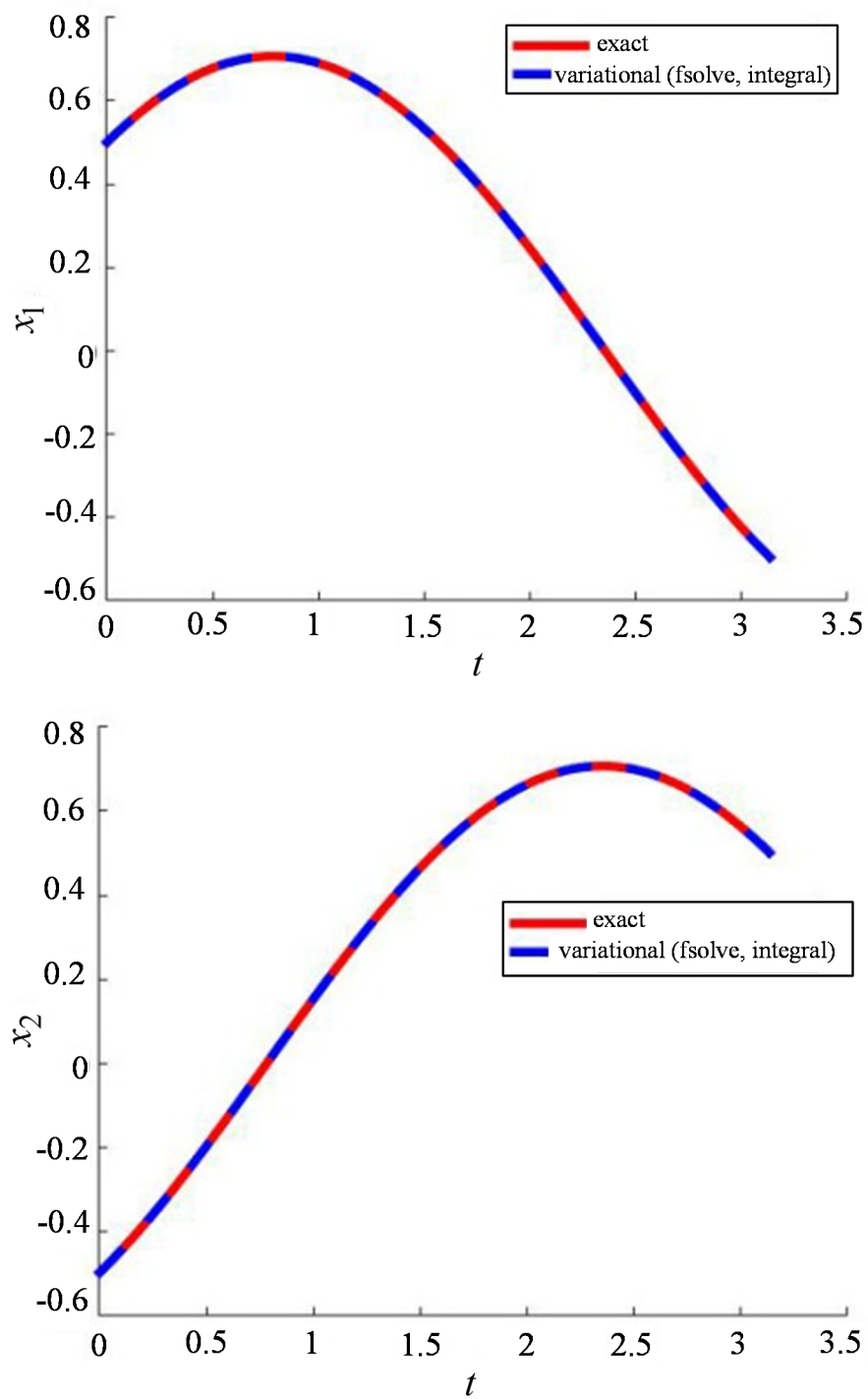


Figure 2.7. Solutions obtained for a polynomial of degree 5 and “mean” method

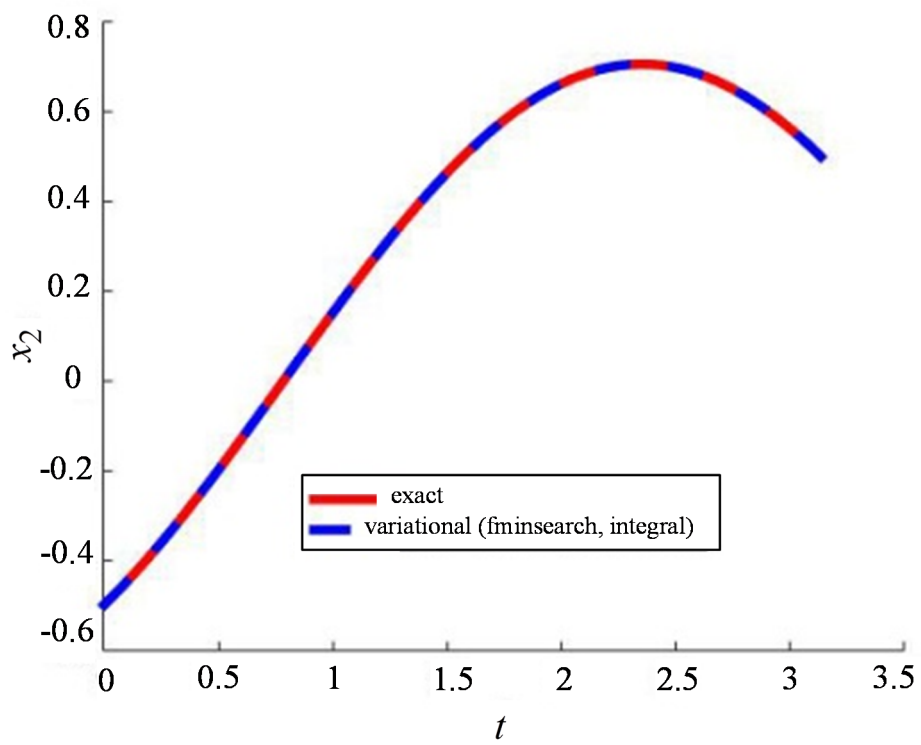
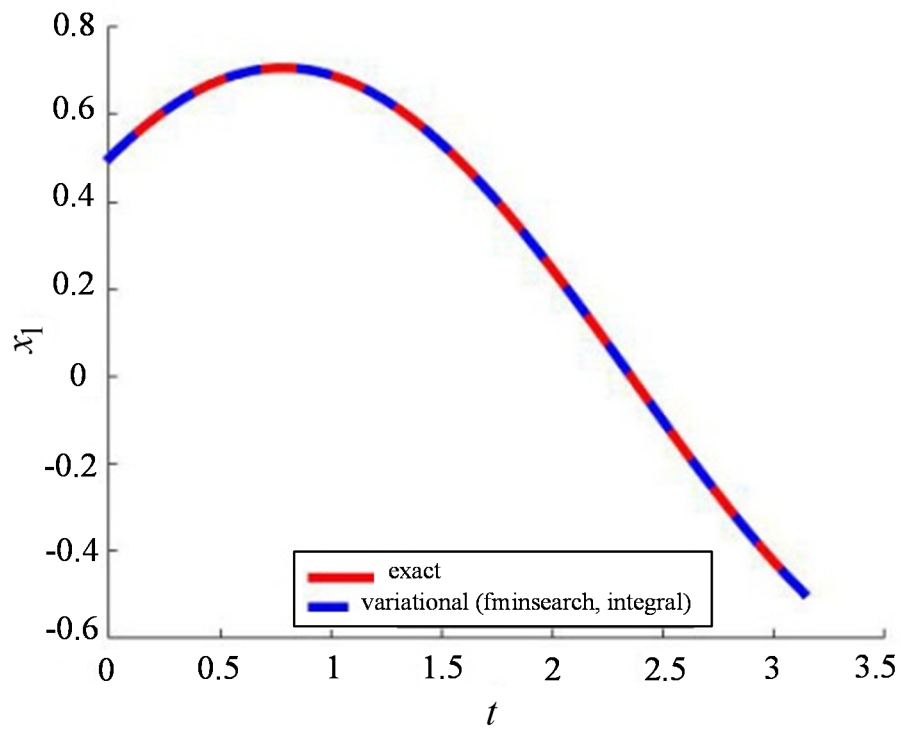


Figure 2.8. Solutions obtained for a polynomial of degree 5 and “integral” method

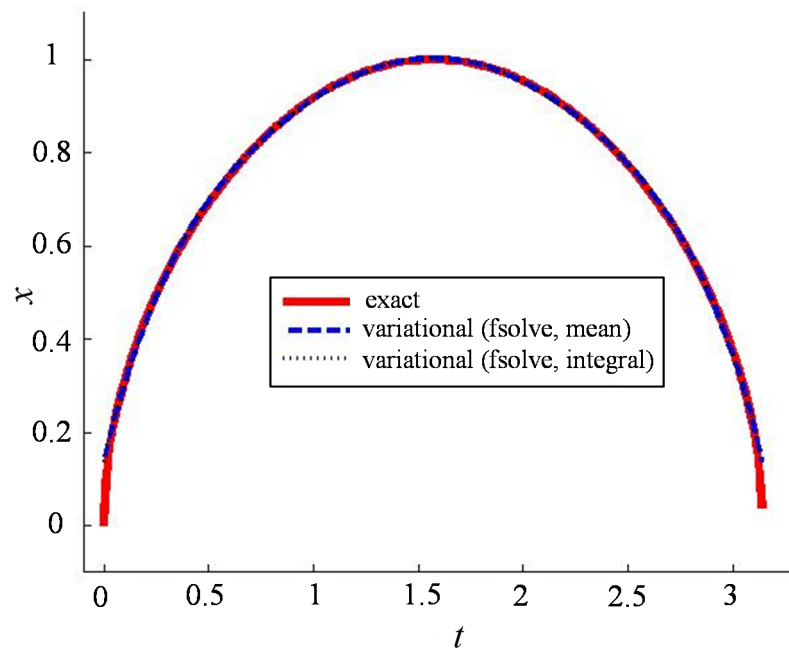


Figure 2.9. Solutions obtained for a polynomial of degree 6

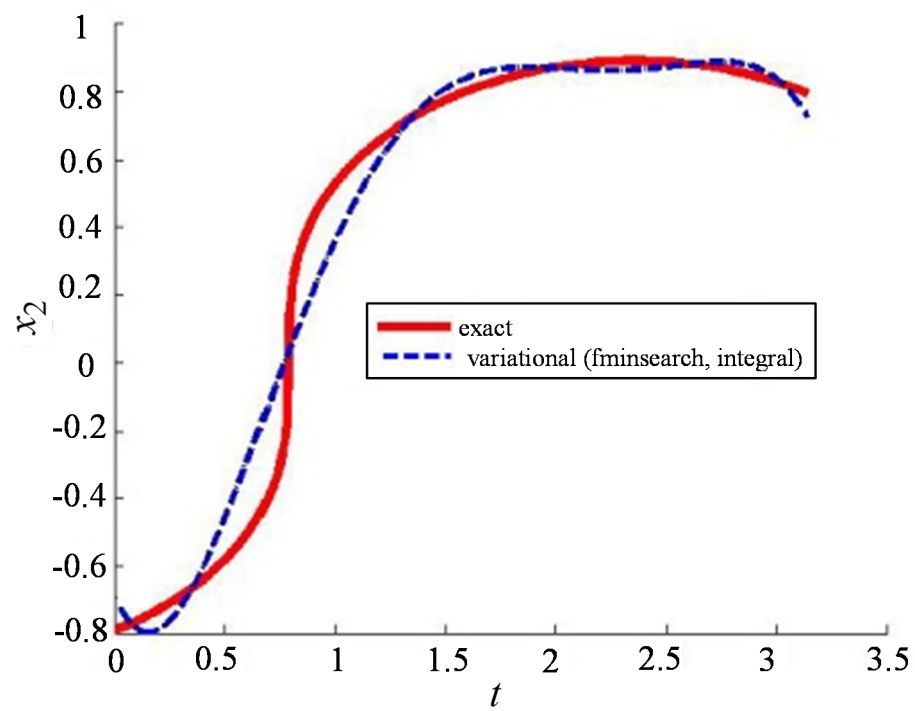
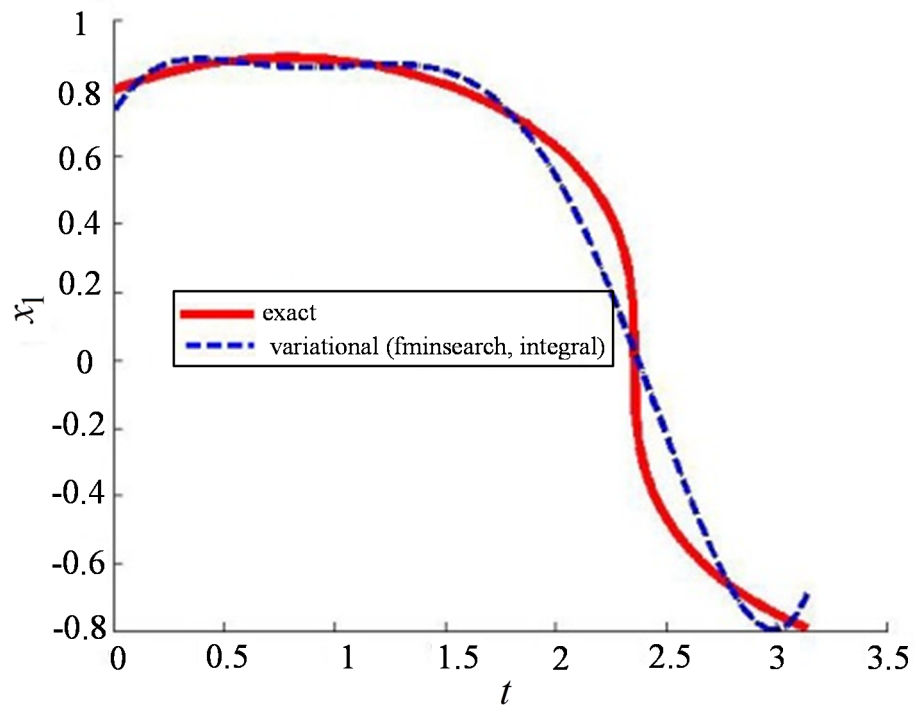


Figure 2.10. Solutions obtained for a polynomial of degree 5

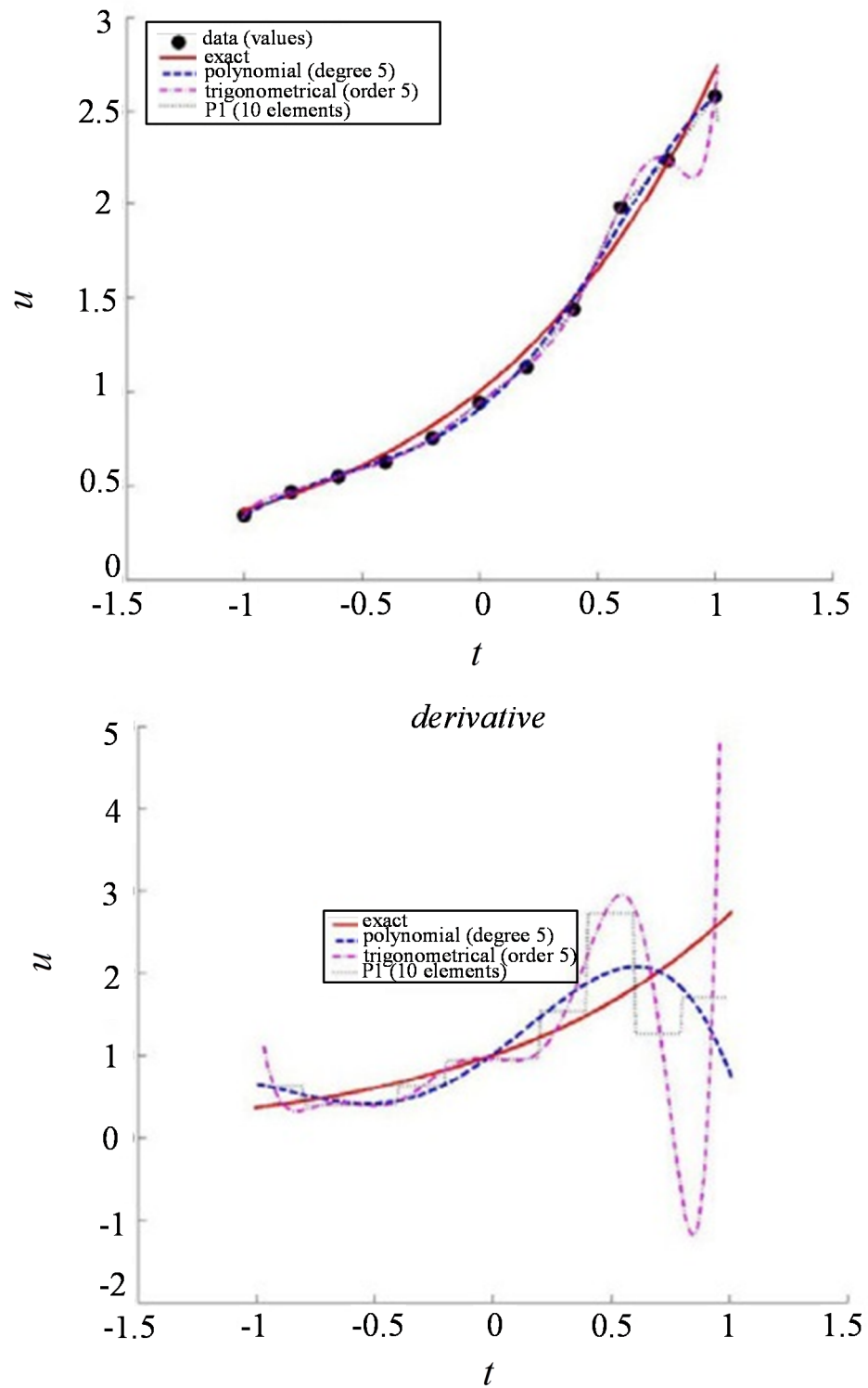


Figure 2.11. Solutions obtained by collocation using different basis

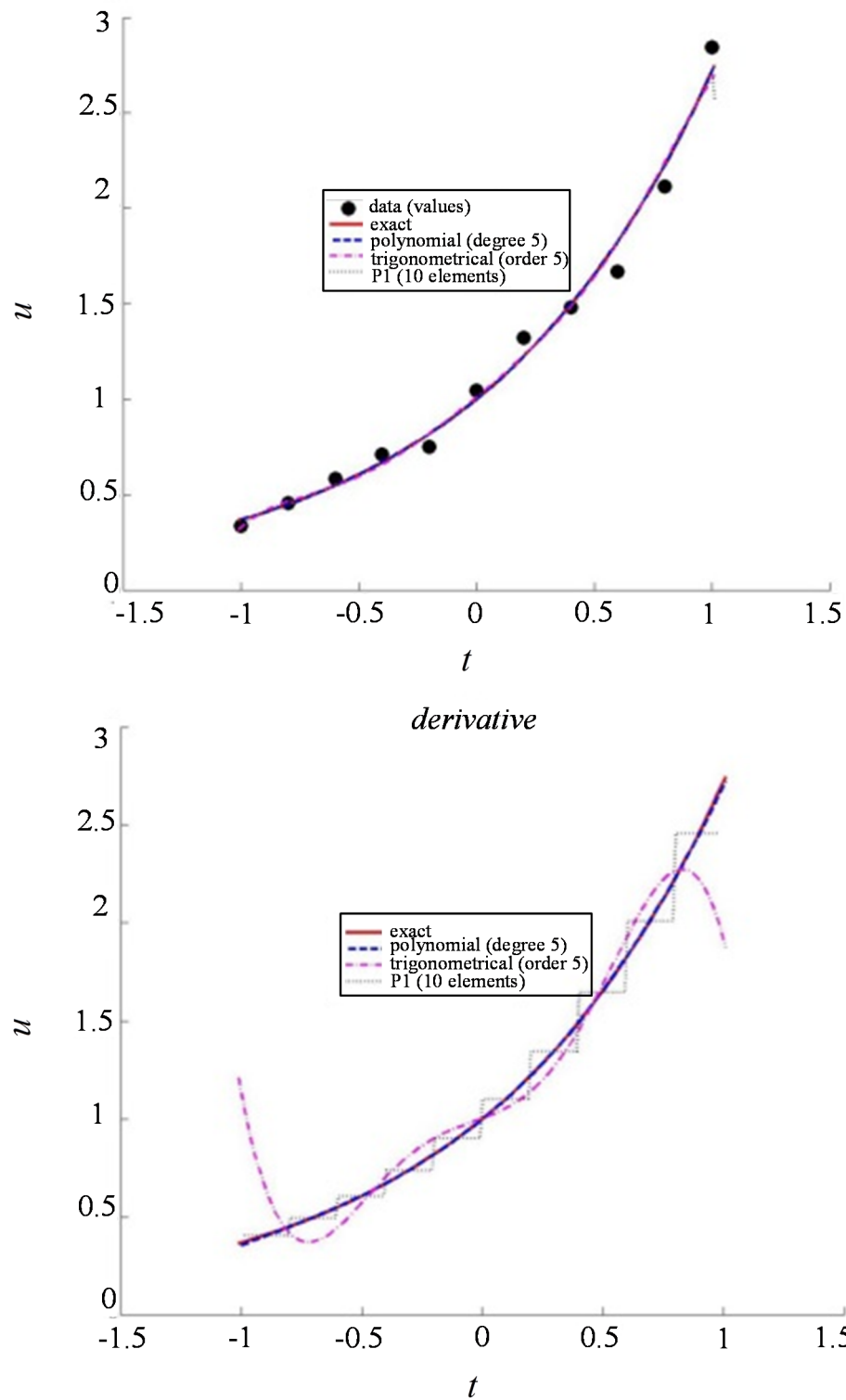


Figure 2.12. Solutions obtained by variational approach (mean) using different basis

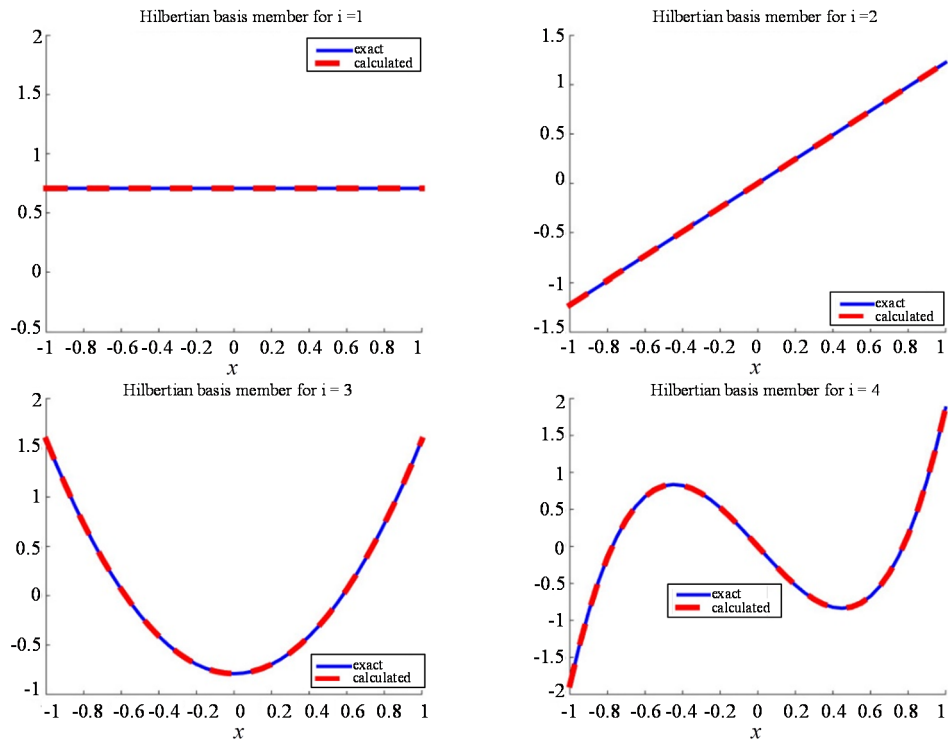


Figure 3.1. Results for example 3.4 (using `sp0` and 'subprograms')

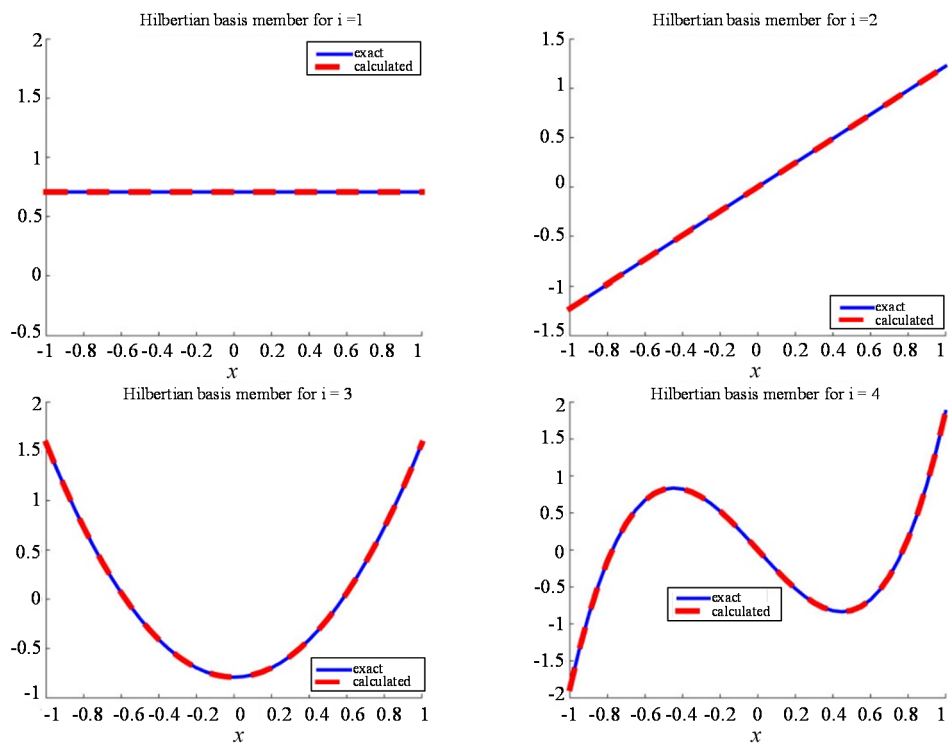


Figure 3.2. Results for example 3.4 (using `sp0` and 'tables')

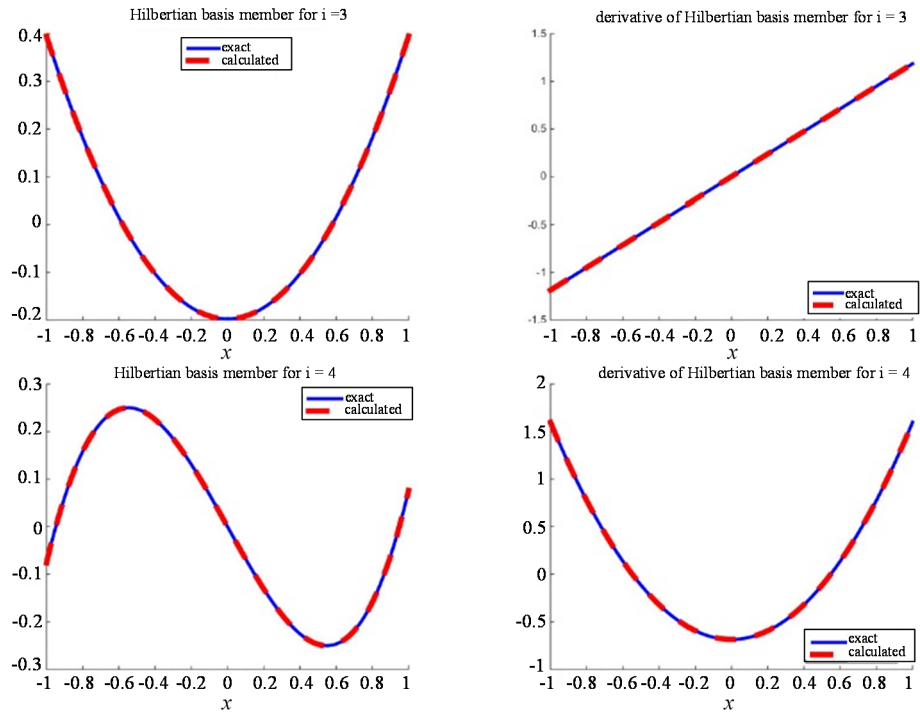


Figure 3.3. Results for example 3.4 using *sp1* and 'subprograms'

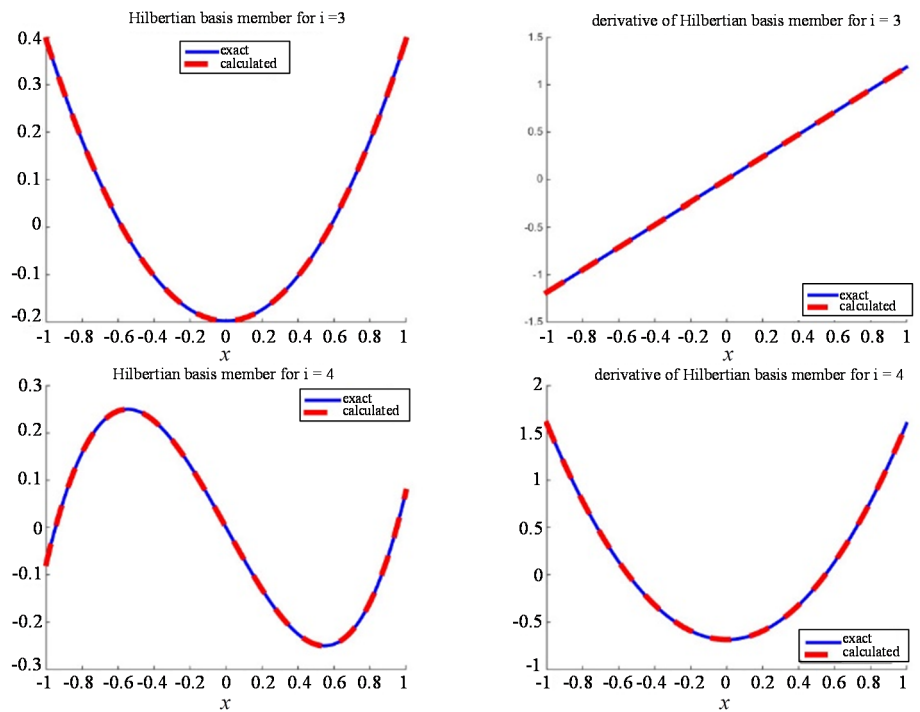


Figure 3.4. Results for example 3.4 using *sp1* and 'tables'

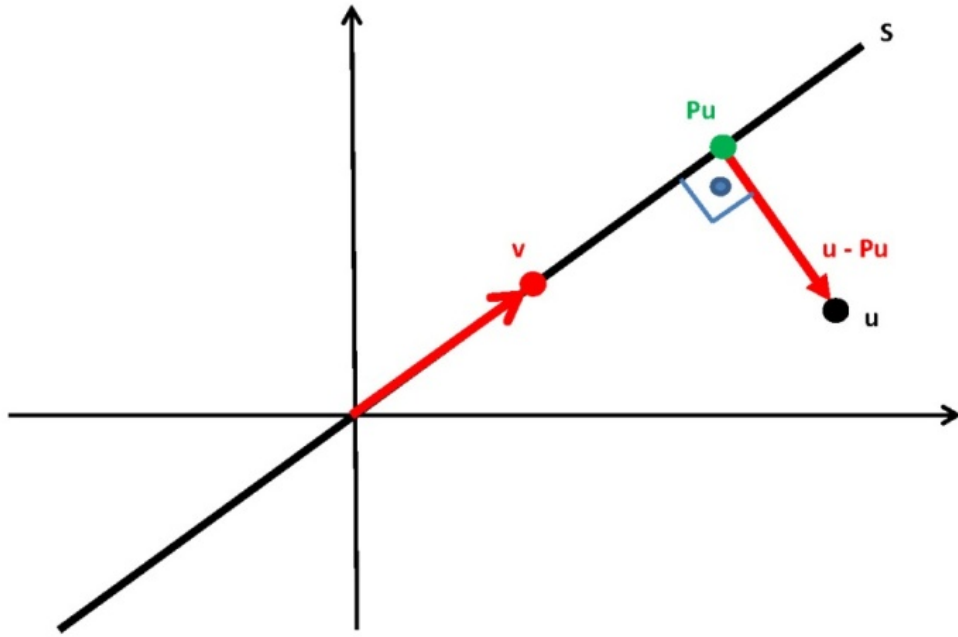


Figure 3.5. Geometrical interpretation of the orthogonal projection on a vector subspace

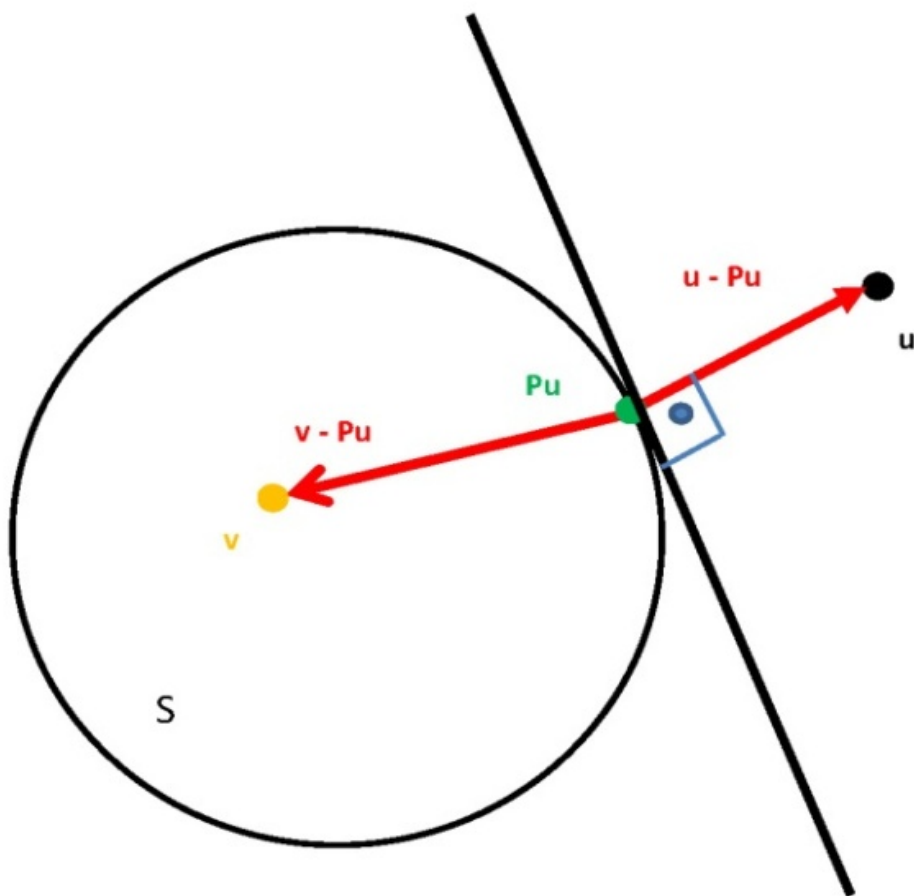


Figure 3.6. Geometrical interpretation of the orthogonal projection on a convex subset

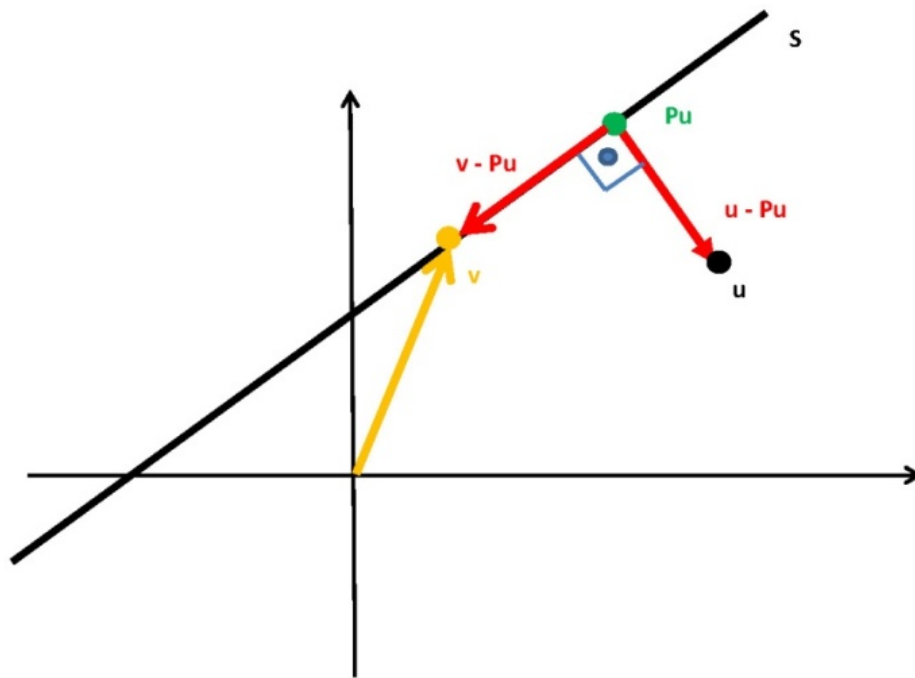


Figure 3.7. Geometrical interpretation of the orthogonal projection on an affine subspace

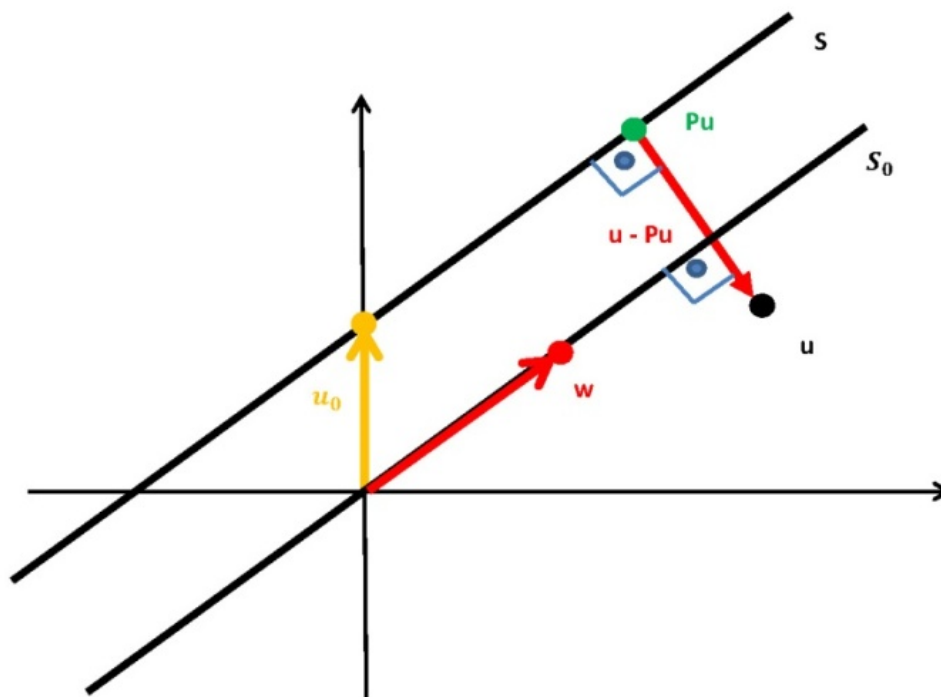
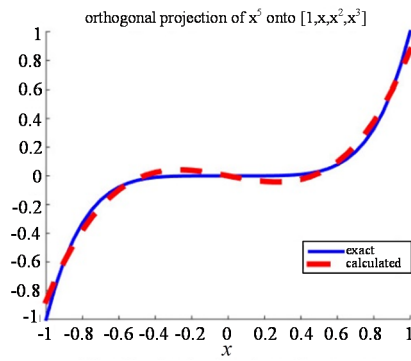
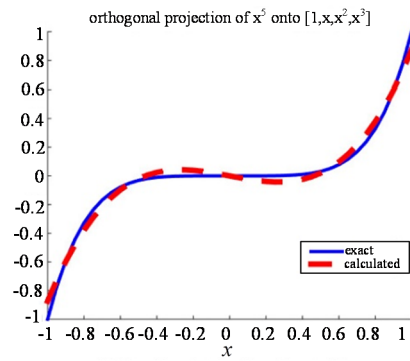


Figure 3.8. A second interpretation of the orthogonal projection on an affine subspace

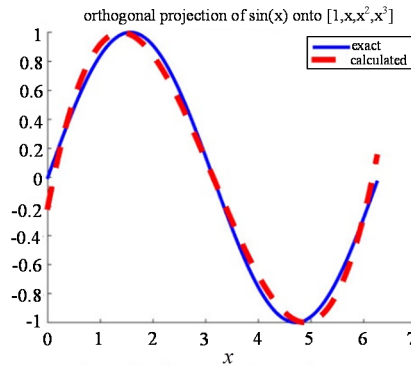


(a) Results obtained using subprograms

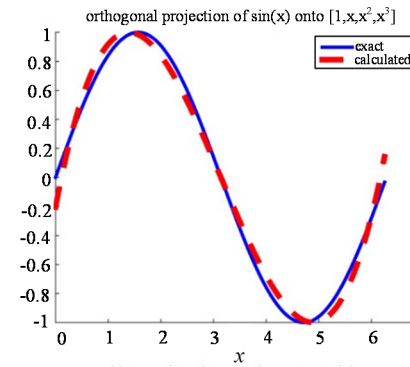


(b) Results obtained using tables

Figure 3.9. Orthogonal projection of x^5 onto a polynomial subspace (degree ≤ 3)



(a) Results obtained using subprograms



(b) Results obtained using tables

Figure 3.10. Orthogonal projection of $\sin(x)$ onto a polynomial subspace (degree ≤ 3)

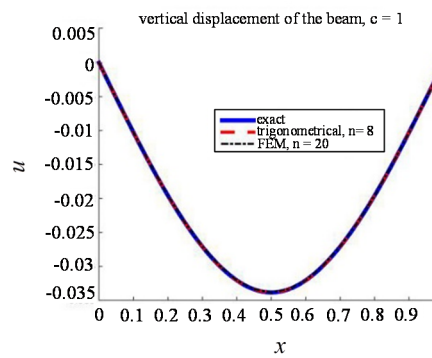
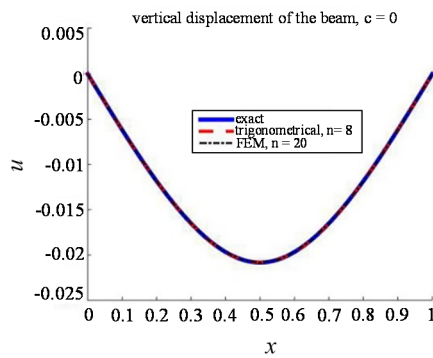


Figure 5.2. Examples of solutions for beam under flexion

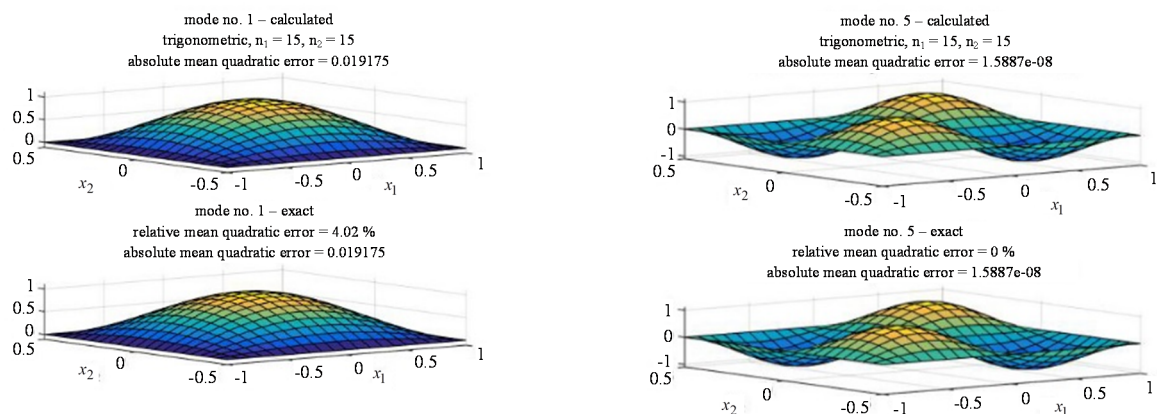


Figure 5.4. Examples of modes furnished by the trigonometric family

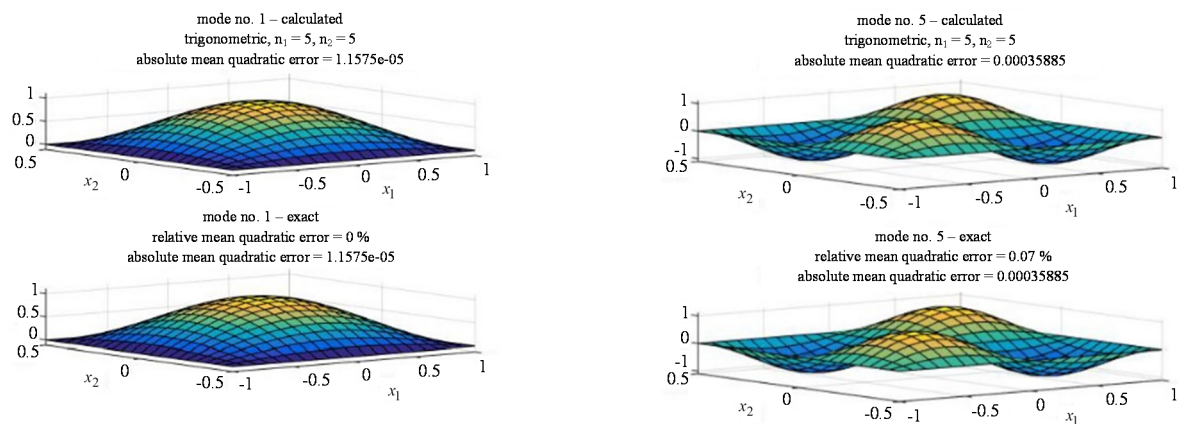


Figure 5.5. Examples of modes furnished by the polynomial family

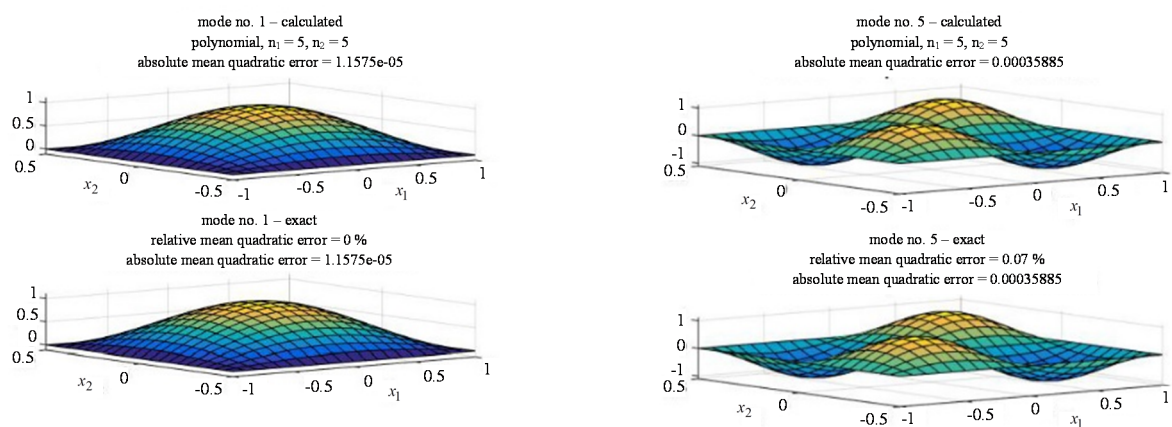


Figure 5.6. Examples of modes furnished by the Q2 family

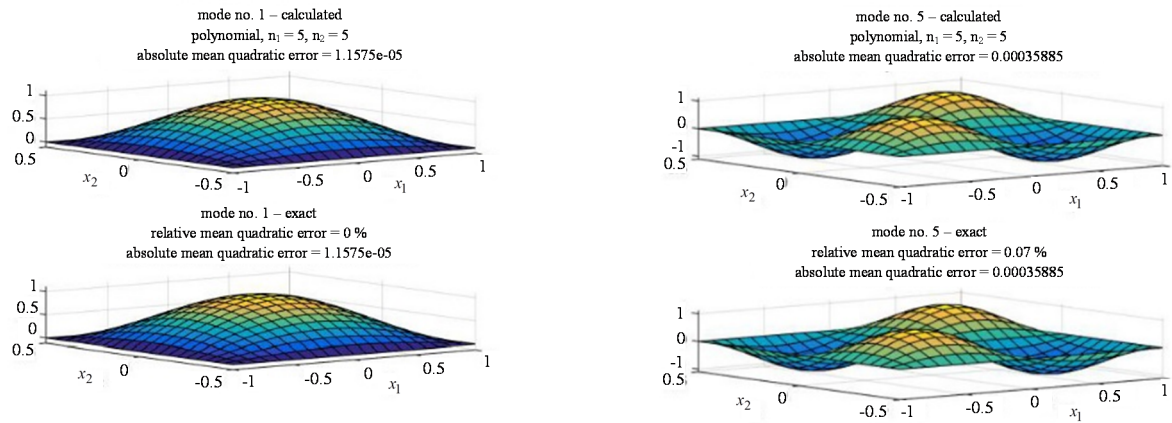


Figure 5.7. Examples of modes furnished by the T1 family

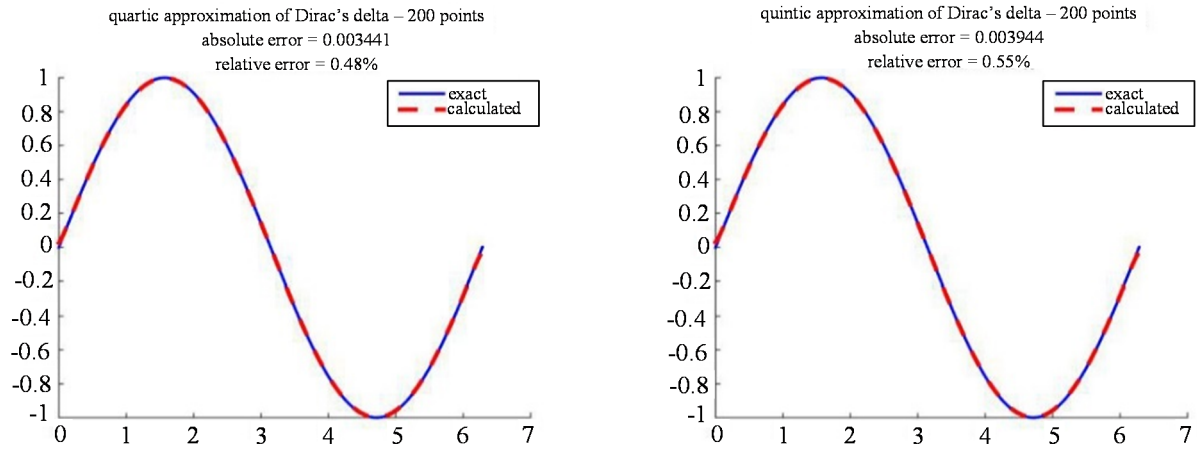


Figure 6.2. An example of smoothed particle approximation

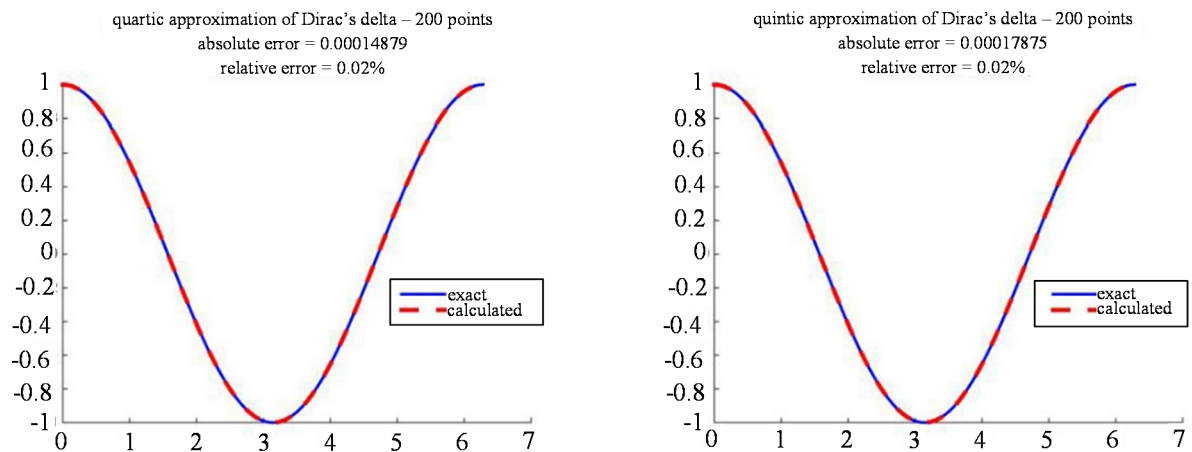


Figure 6.3. An example of numerical derivation using smoothed particle approximation

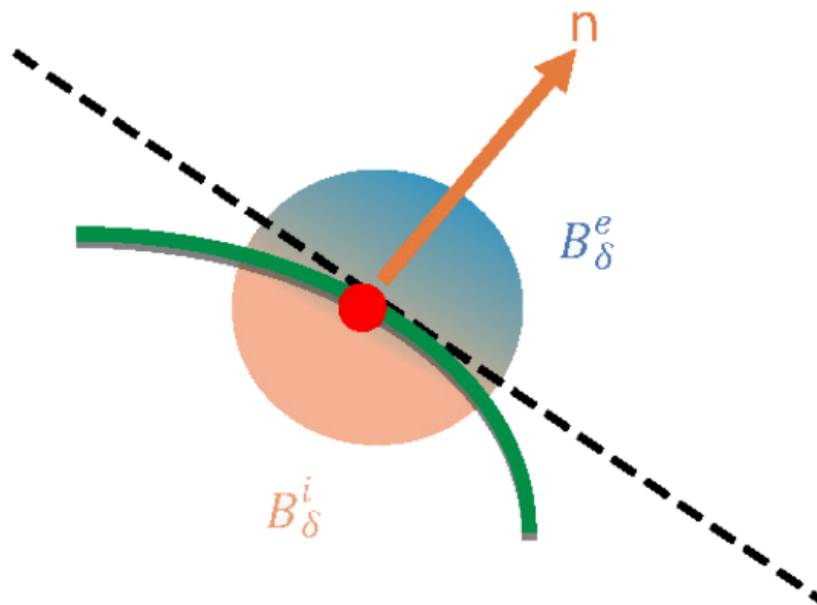


Figure 6.1. Approximation of the set Ω by Ω_δ .

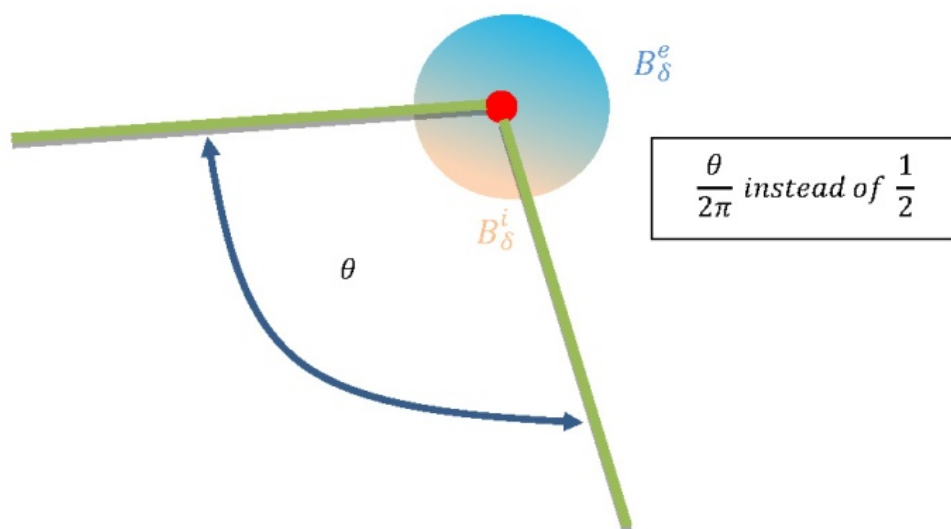


Figure 6.5. Approximation of the set Ω in the non-smooth case

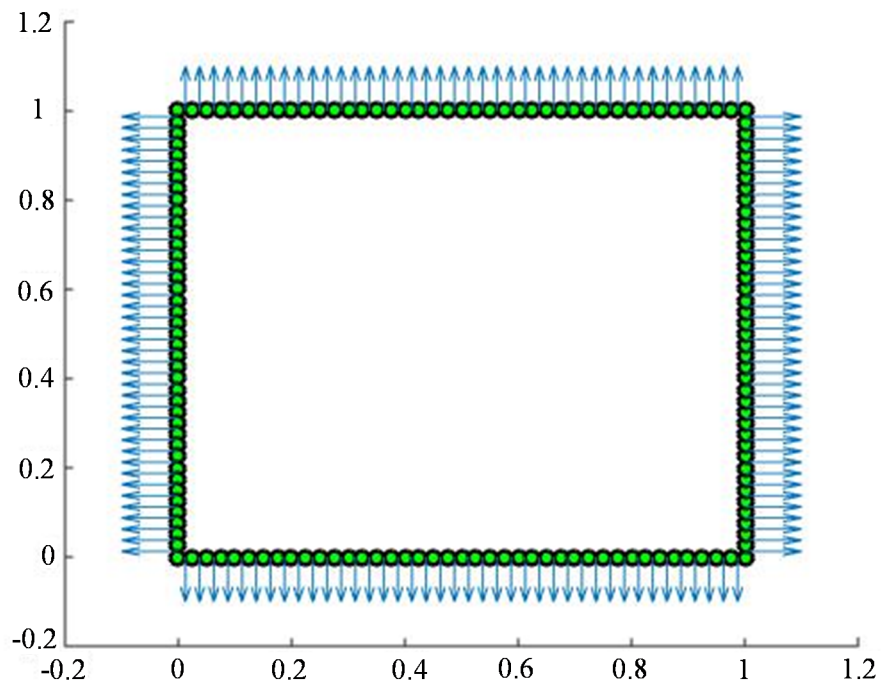


Figure 6.6. The discretization used in example 6.5

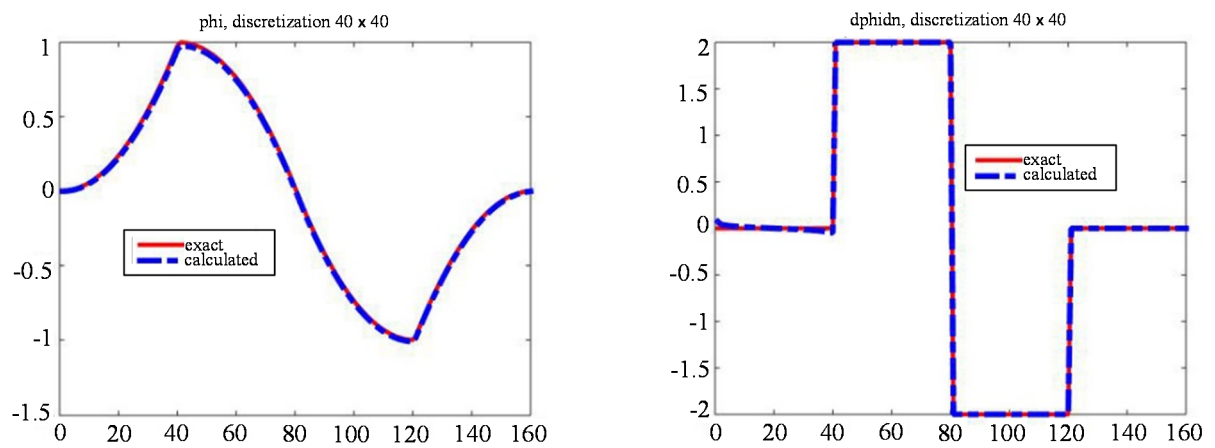


Figure 6.7. Example of numerical solution by Green's function (example 6.5)

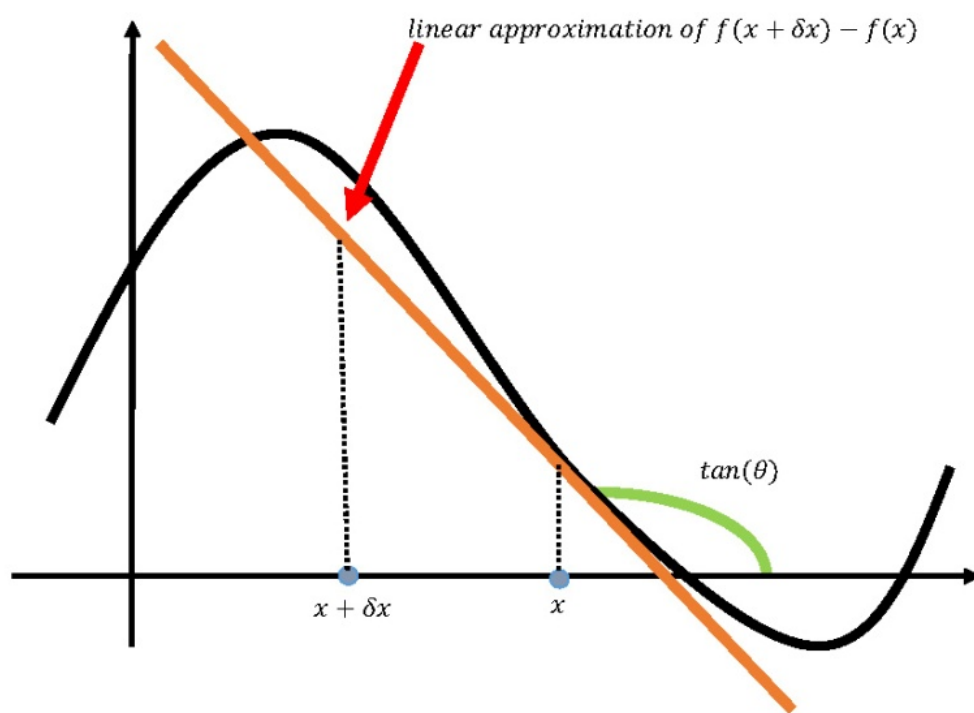


Figure 7.1. *Differential of a functional*