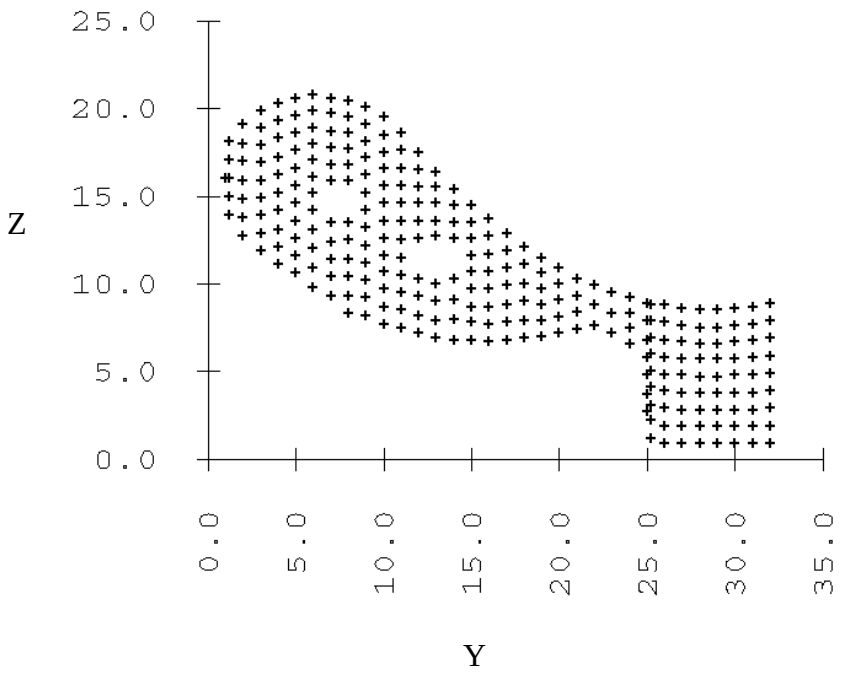

Figure 1. 3-D Object (Uniform Thickness) in Original Y-Z Plane, showing integration point coverage on problem boundary. Note two holes in the problem domain.

Inside these holes there exist two source points, P_1 and P_2, located at the centers of the holes and another source point, P_3, located 2.5 units from the right lower corner of the object. The source values are 500, 1000 and 500 at P_1, P_2, and P_3, respectively. The exact solution is given as

$$\omega = \frac{500}{R_1} + \frac{1000}{R_2} + \frac{500}{R_3}$$

where

$$R_j = \sqrt{(x_i - x_{p_j})^2 + (y_i - y_{p_j})^2 + (z_i - z_{p_j})^2}$$

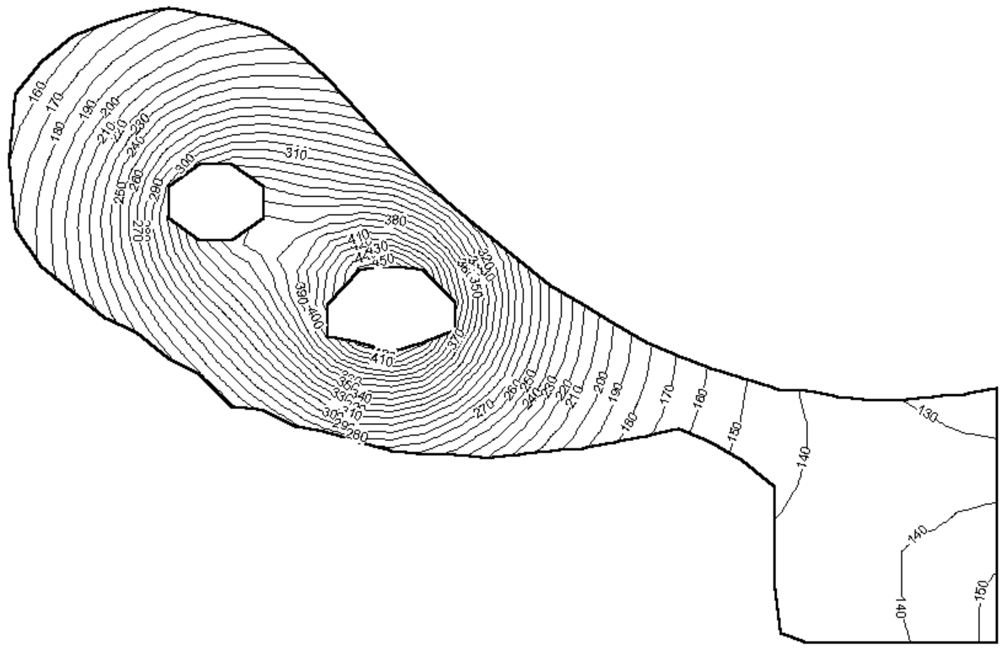

Figure 2. Exact Solution Plot at *X* = 1 (local coordinate X* = 17.17). Note irregular boundary containing numerous vertices.

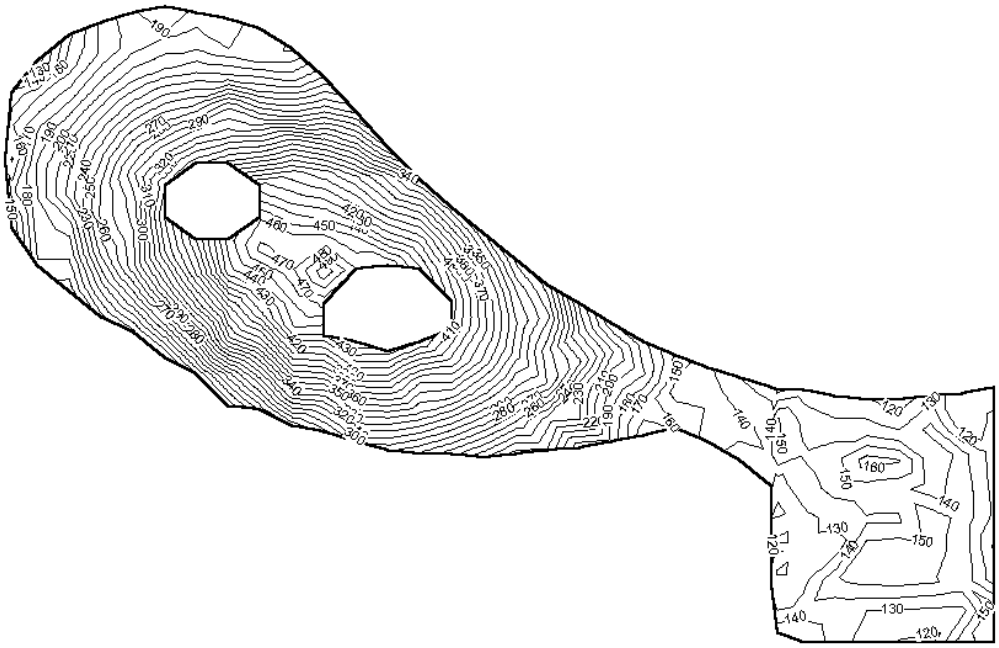

Figure 3. CVBEM Approximations at X = 1 (local coordinate X* = 17.17).

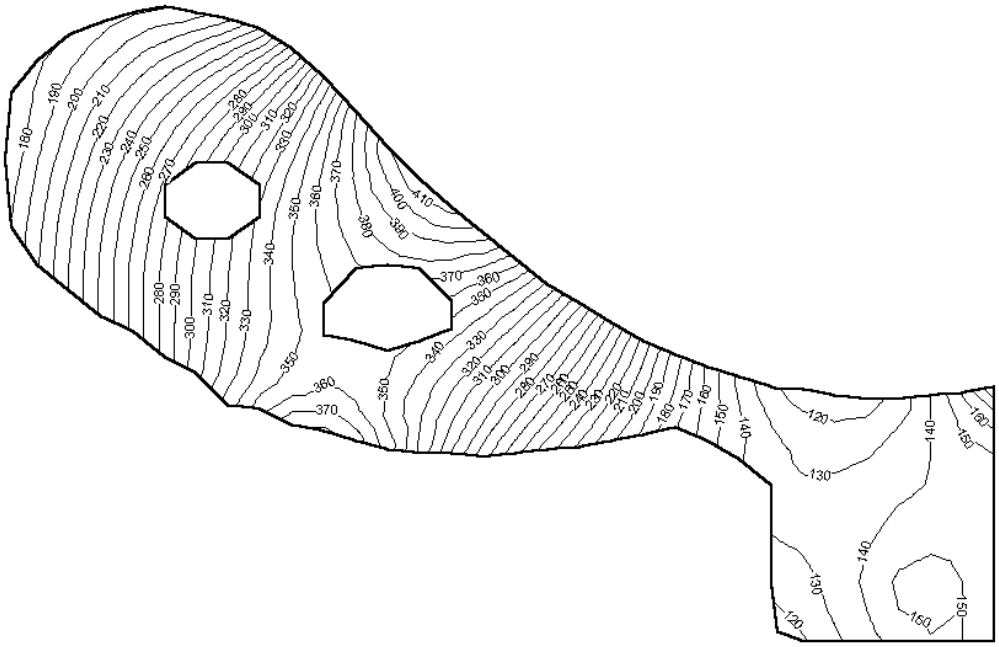

Figure 4. RVBEM Approximations at X = 1 (local coordinate X* = 17.17).

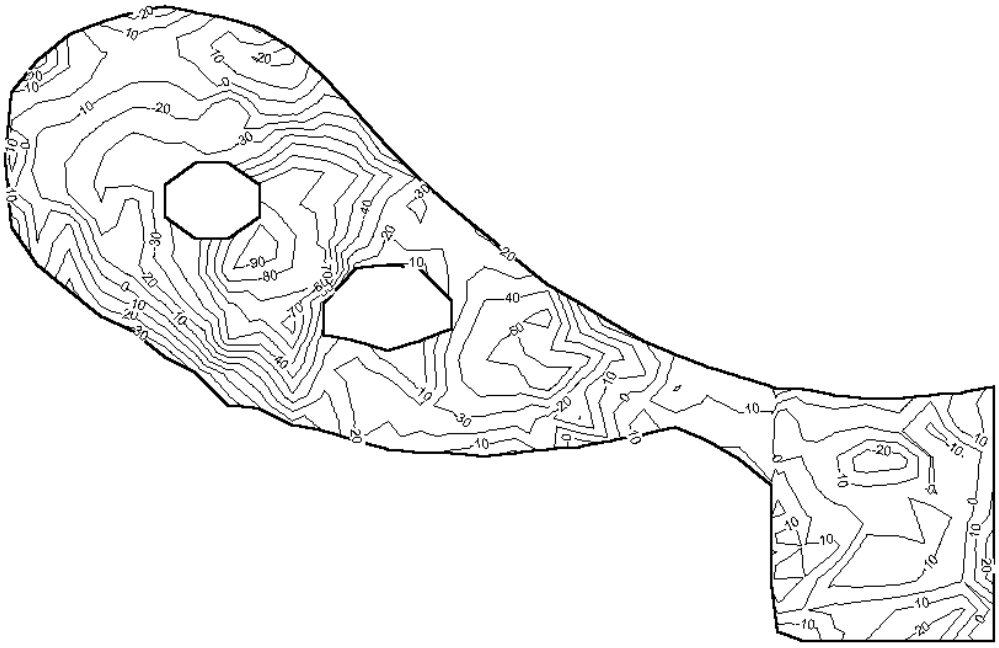

Figure 5. CVBEM Approximation Error at X = 1 (local coordinate X* = 17.17).

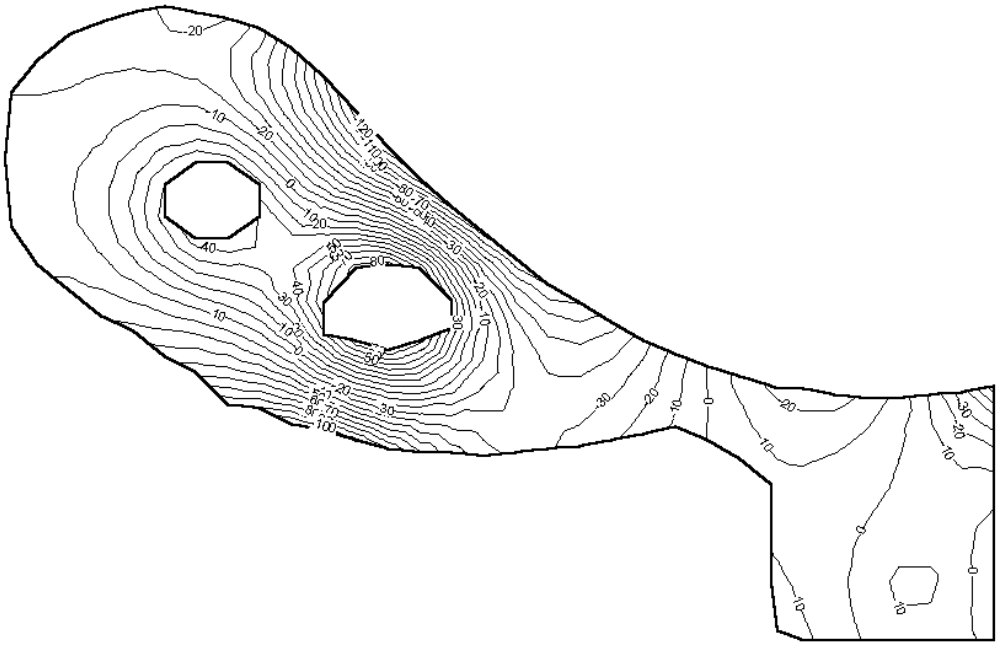

Figure 6. RVBEM Approximation Error at X = 1 (local coordinate X* = 17.17).

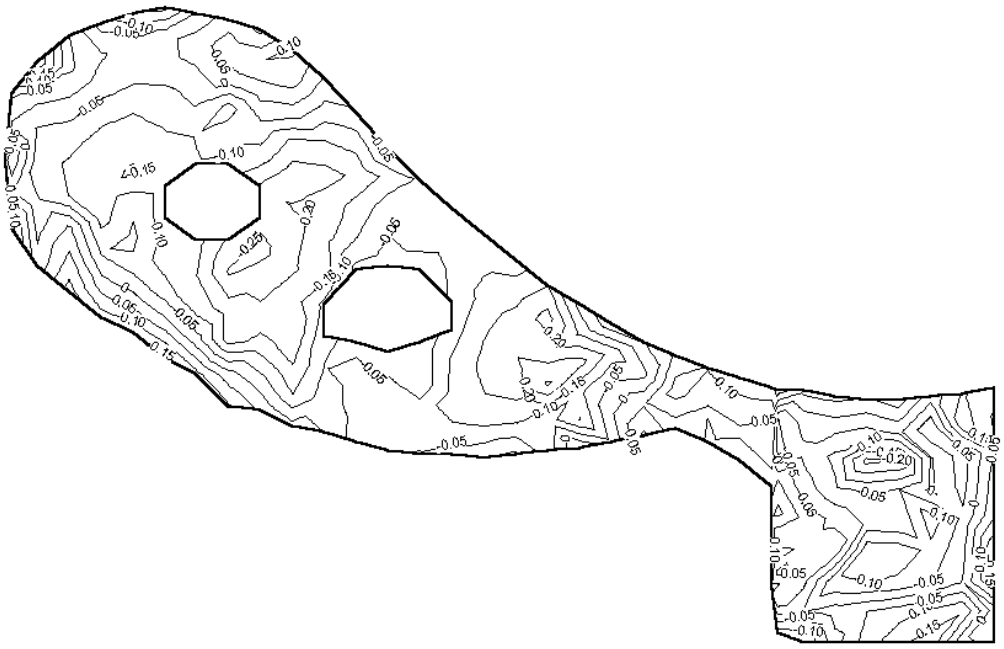

Figure 7. CVBEM Relative Errors (decimal) at X = 1 (local coordinate X* = 17.17).

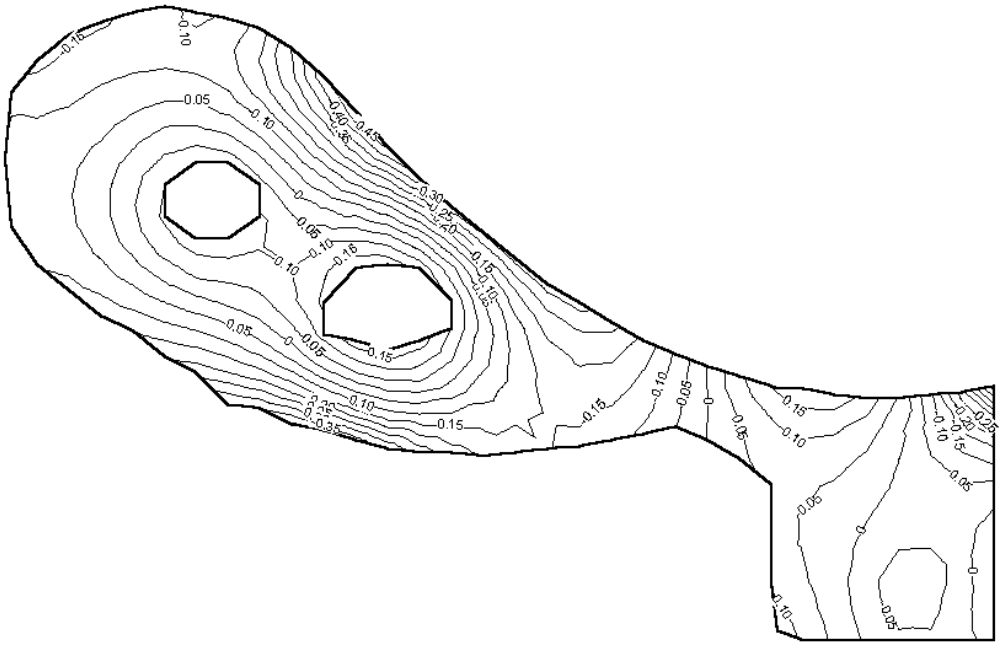

Figure 8. RVBEM Relative Errors (decimal) at X = 1 (local coordinate X* = 17.17).

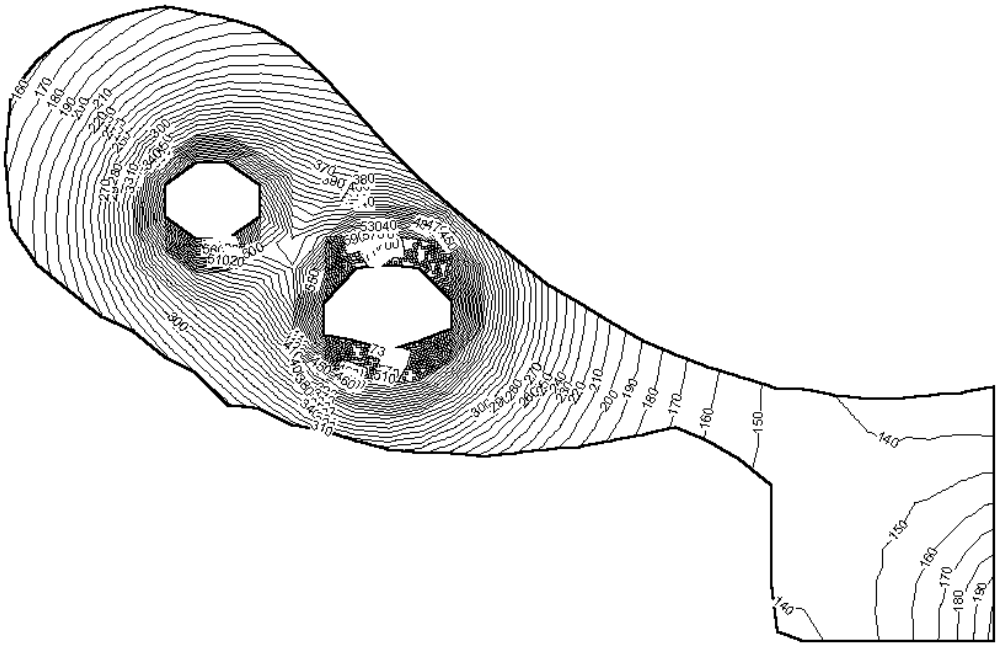

Figure 9. Exact Solution Plot at Slice through center of Ω, X = 3.5 (local coordinate X* = 19.67).

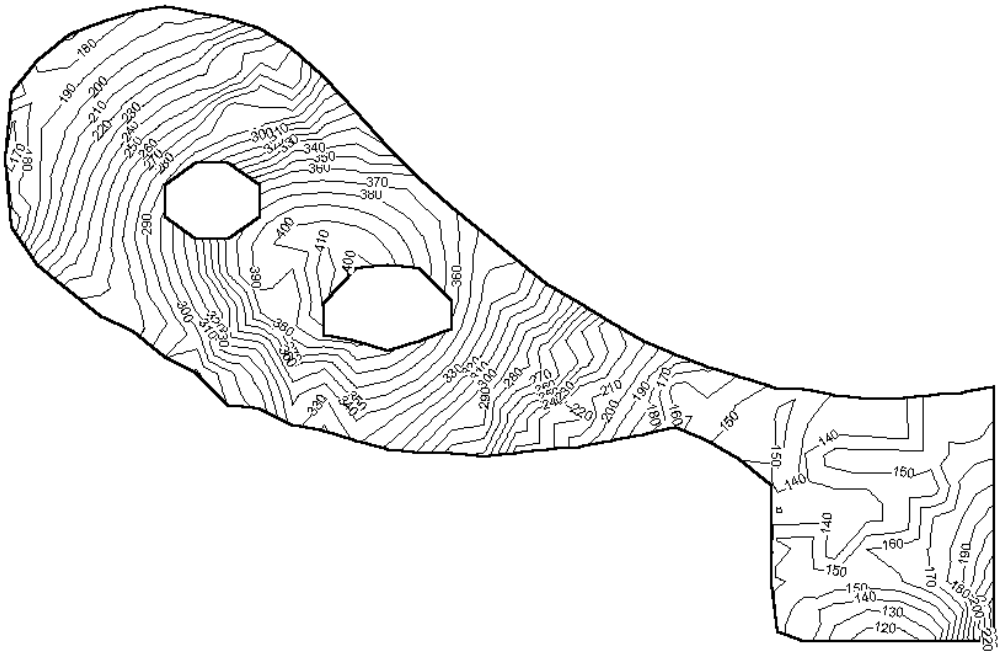

Figure 10. CVBEM Approximations at X = 3.5 (local coordinate X* = 19.67).

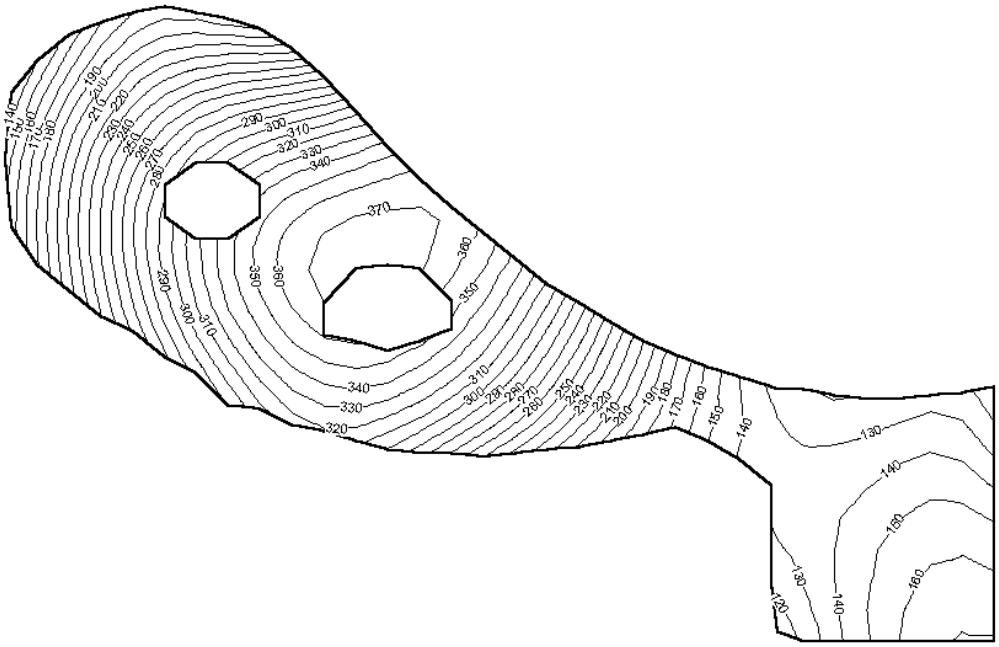

Figure 11. RVBEM Approximations at X = 3.5 (local coordinate X* = 19.67).

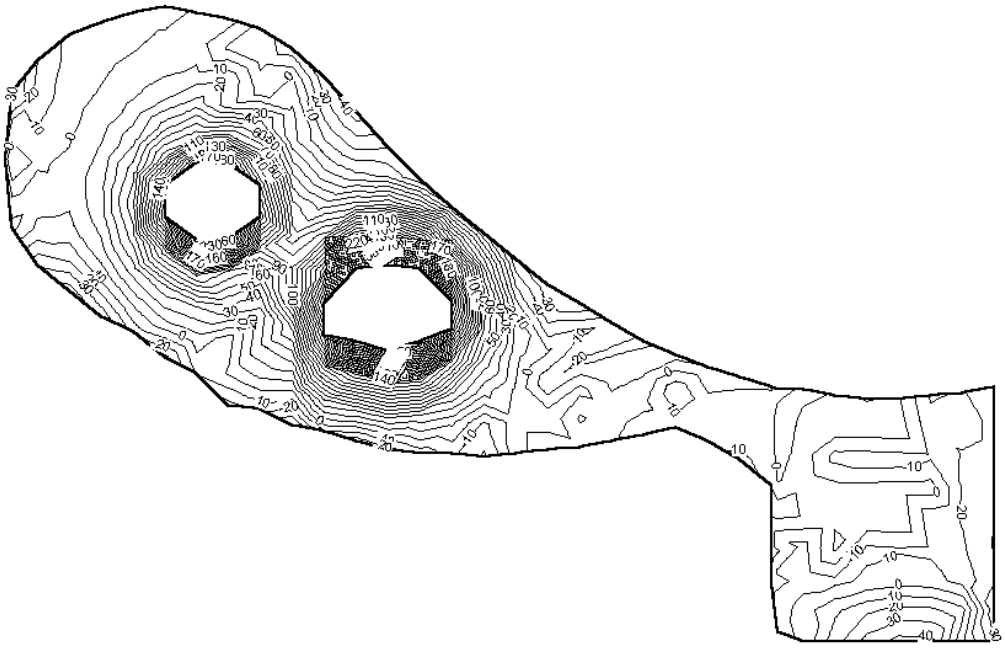

Figure 12. CVBEM Approximation Error at X = 3.5 (local coordinate X* = 19.67).

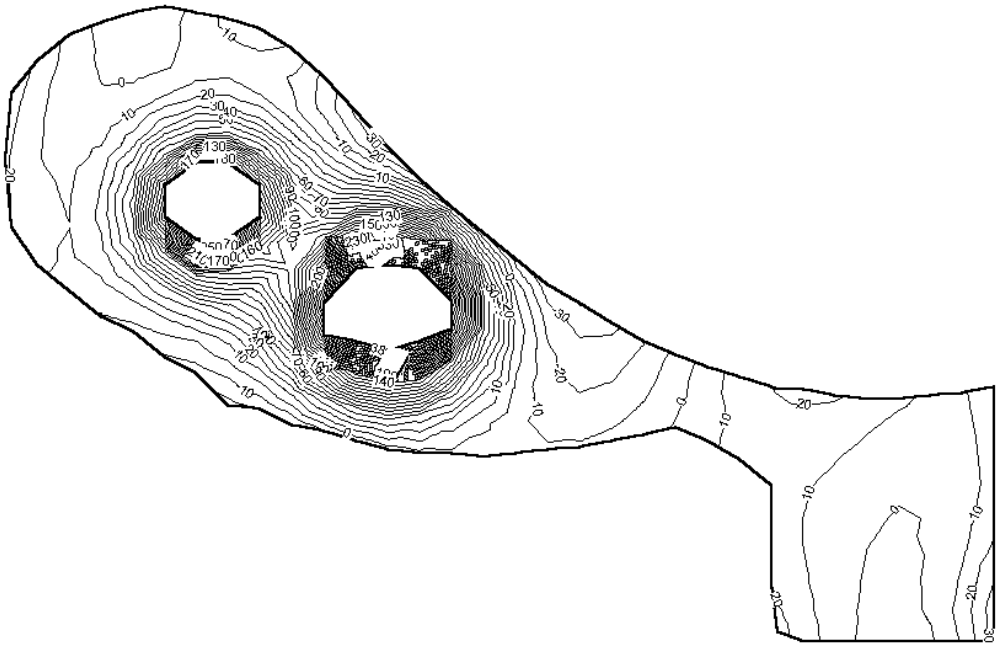

Figure 13. RVBEM Approximation Error at X = 3.5 (local coordinate X* = 19.67).

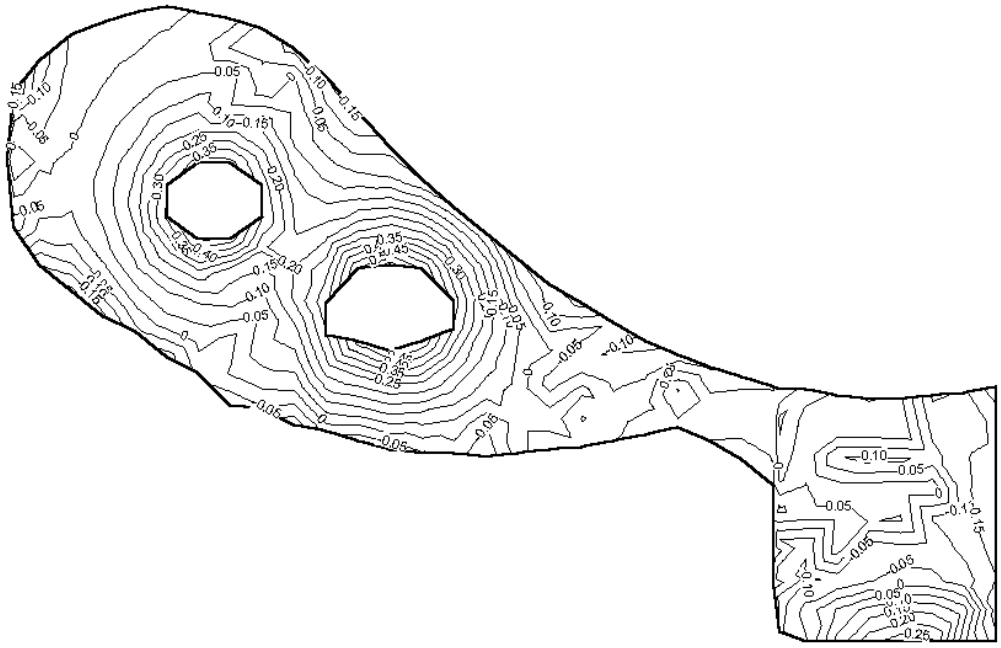

Figure 14. CVBEM Relative Errors (decimal) at X = 3.5 (local coordinate X* = 19.67).

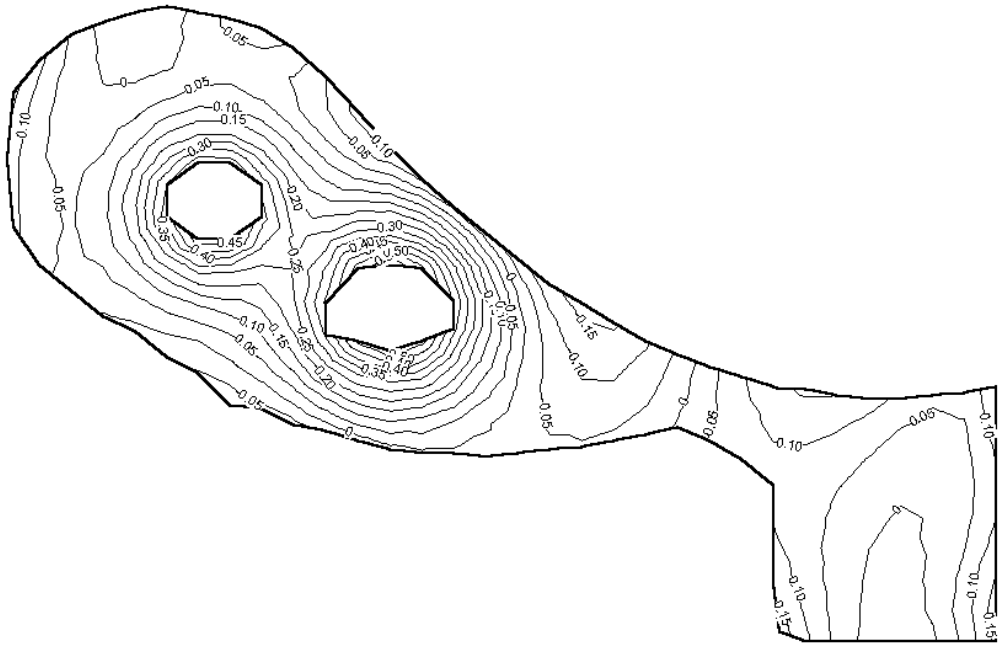

Figure 15. RVBEM Relative Errors (decimal) at X = 3.5 (local coordinate X* = 19.67).

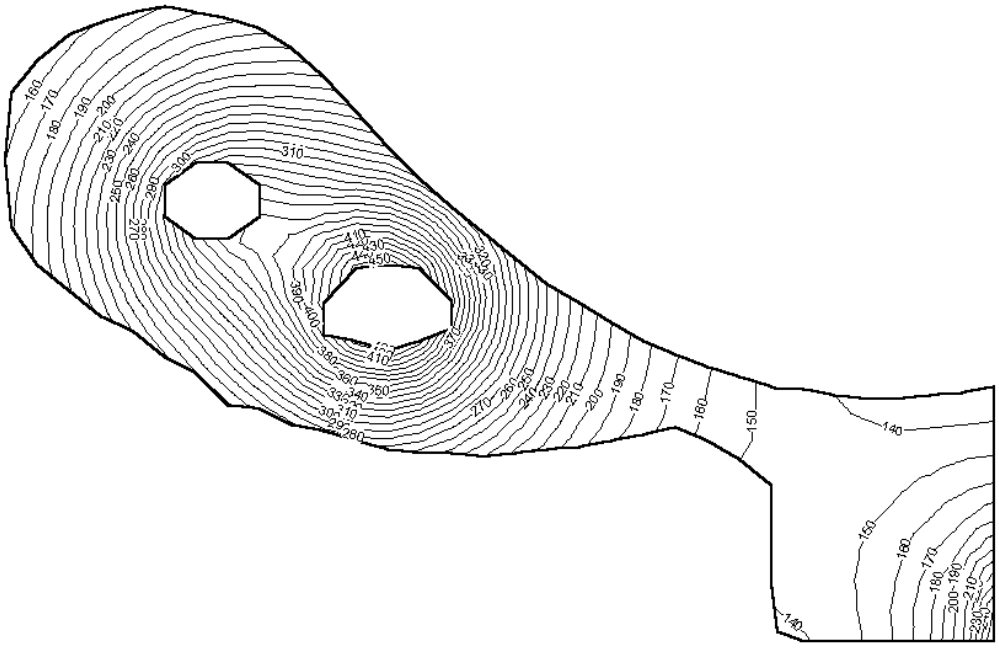

Figure 16. Exact Solution Plot at X = 6 (local coordinate X* = 22.17).

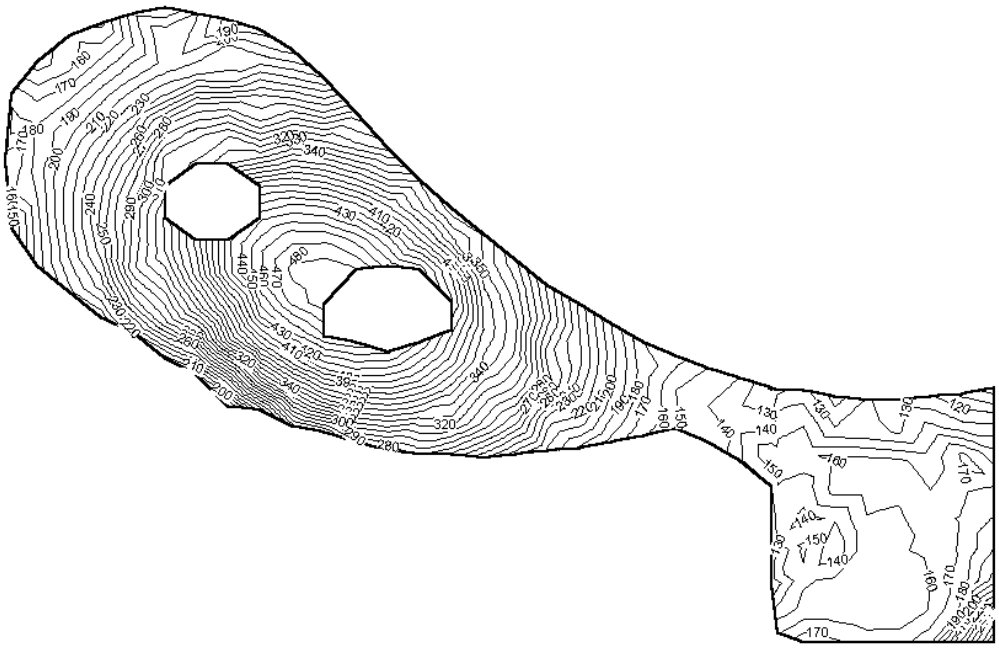

Figure 17. CVBEM Approximations at X = 6 (local coordinate X* = 22.17).

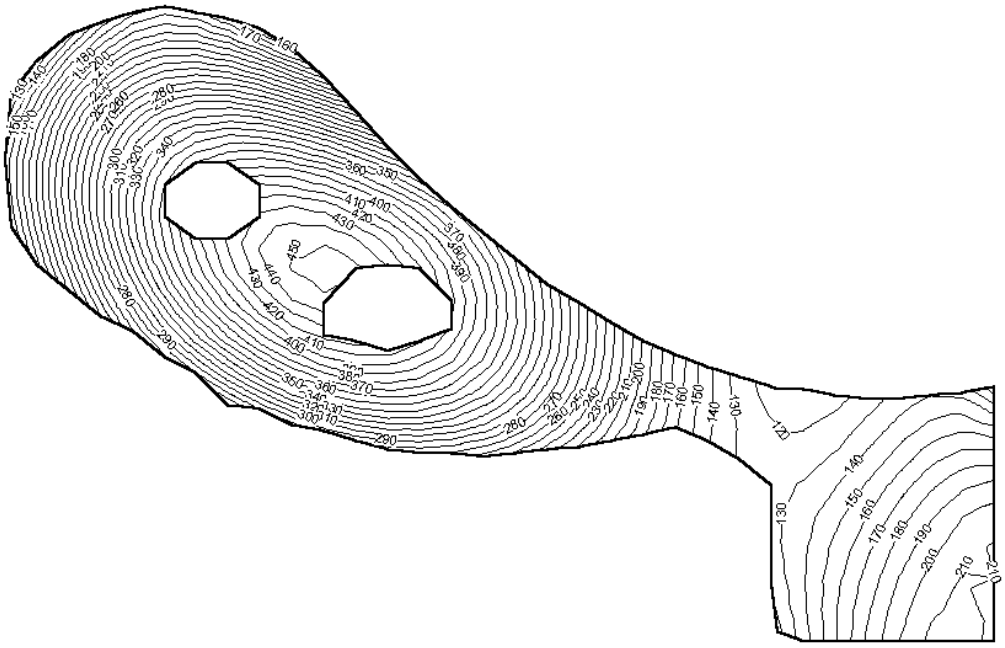

Figure 18. RVBEM Approximations at X = 6 (local coordinate X* = 22.17).

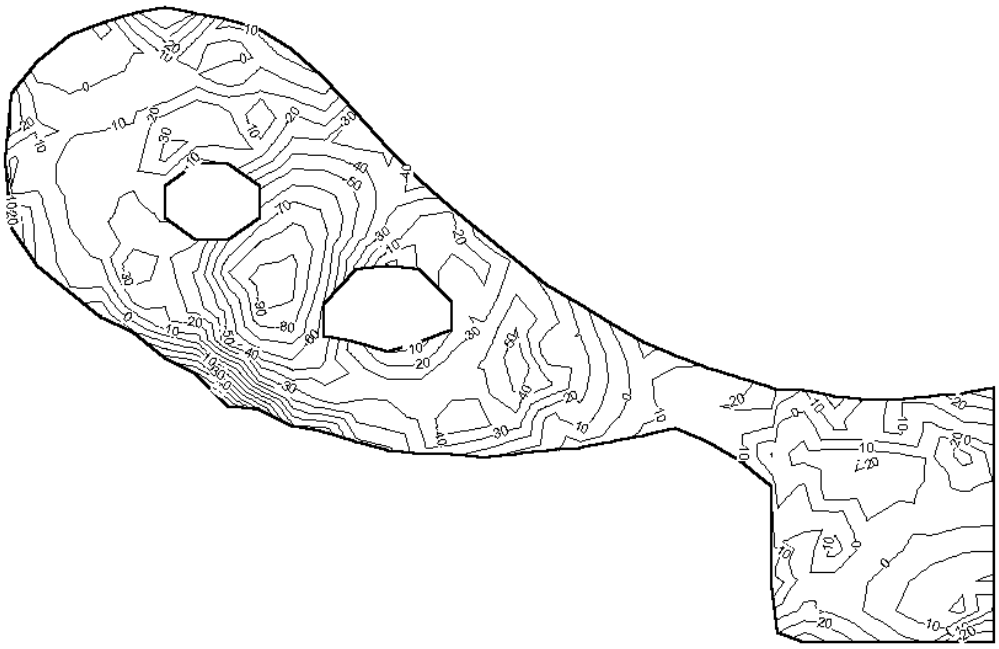

Figure 19. CVBEM Approximation Error at X = 6 (local coordinate X* = 22.17).

Figure 20. RVBEM Approximation Error at X = 6 (local coordinate X* = 22.17).

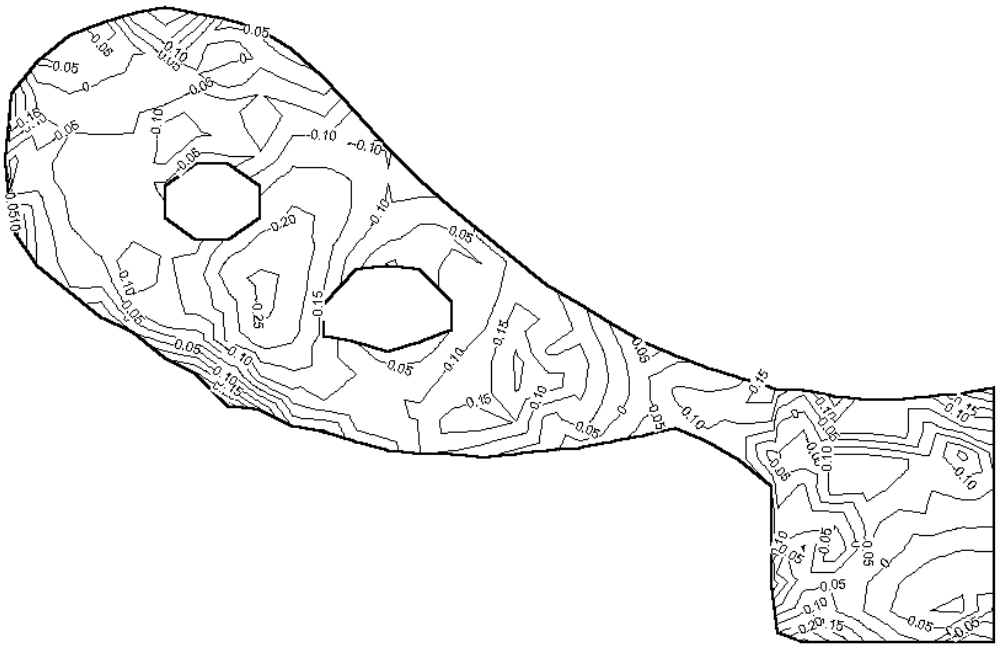

Figure 21. CVBEM Relative Errors (decimal) at X = 6 (local coordinate X* = 22.17).

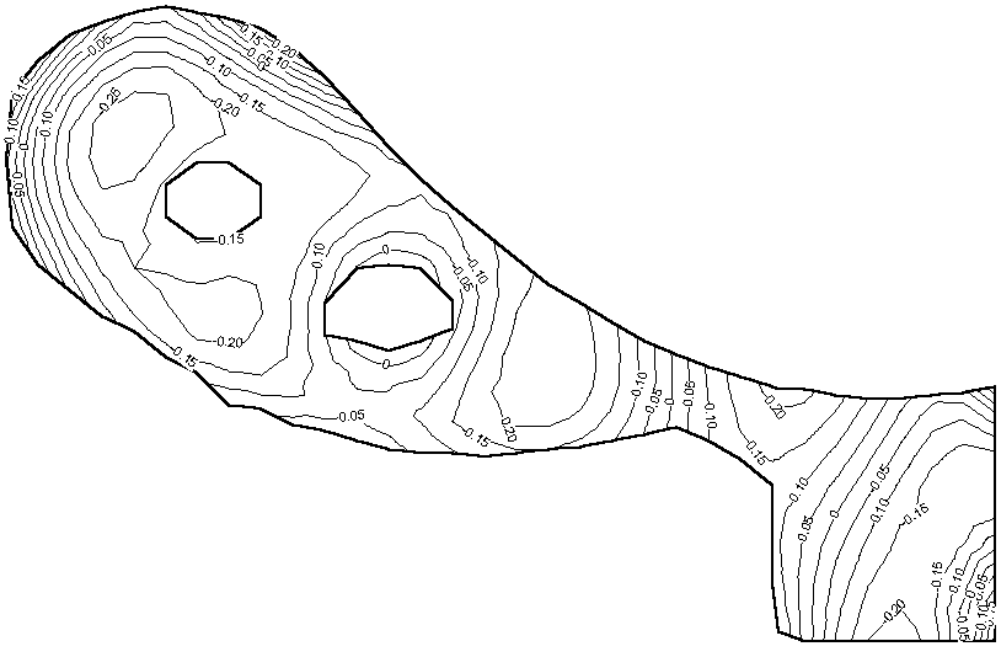

Figure 22. RVBEM Relative Errors (decimal) at X = 6 (local coordinate X* = 22.17).