MACHINE	SOLUTION	max SIZE	CPU TIME	ENERGY
CM5	Full	4096×4096	89s	0.9952
HP9000	2 sweeps	166×166	305s	0.9972
HP9000	3 sweeps	166×166	566s	1.0095

Table 1: Computation data for the surface in Fig. 4.

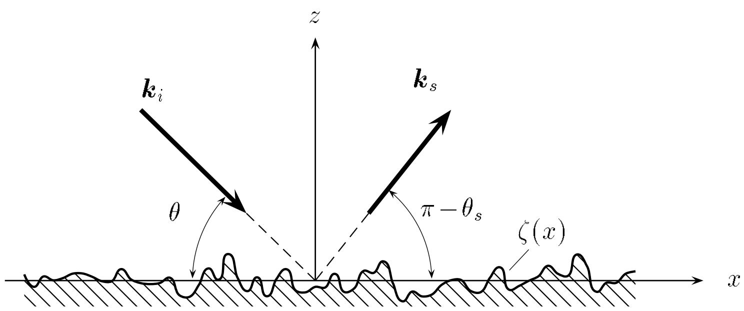

Figure 1: Scattering geometry.

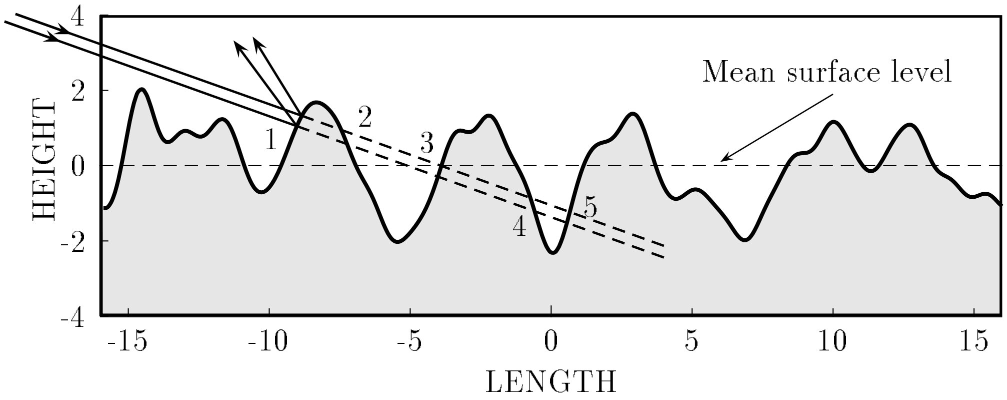

Figure 2: Typical case for beam scattering.

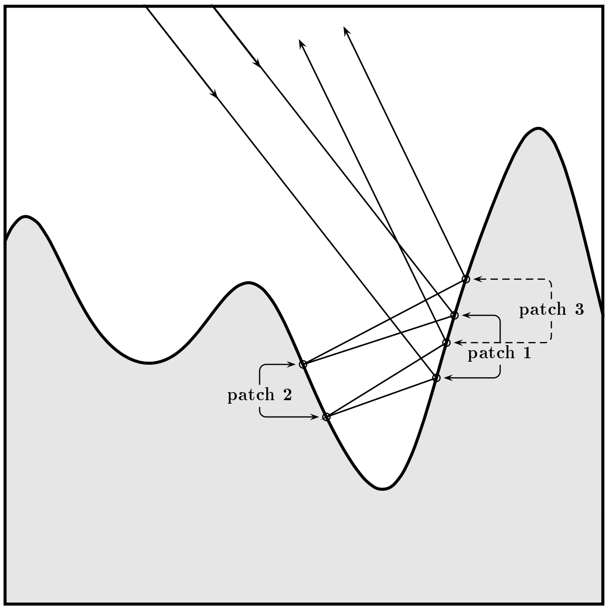

Figure 3: A more complex example: triple scattering.

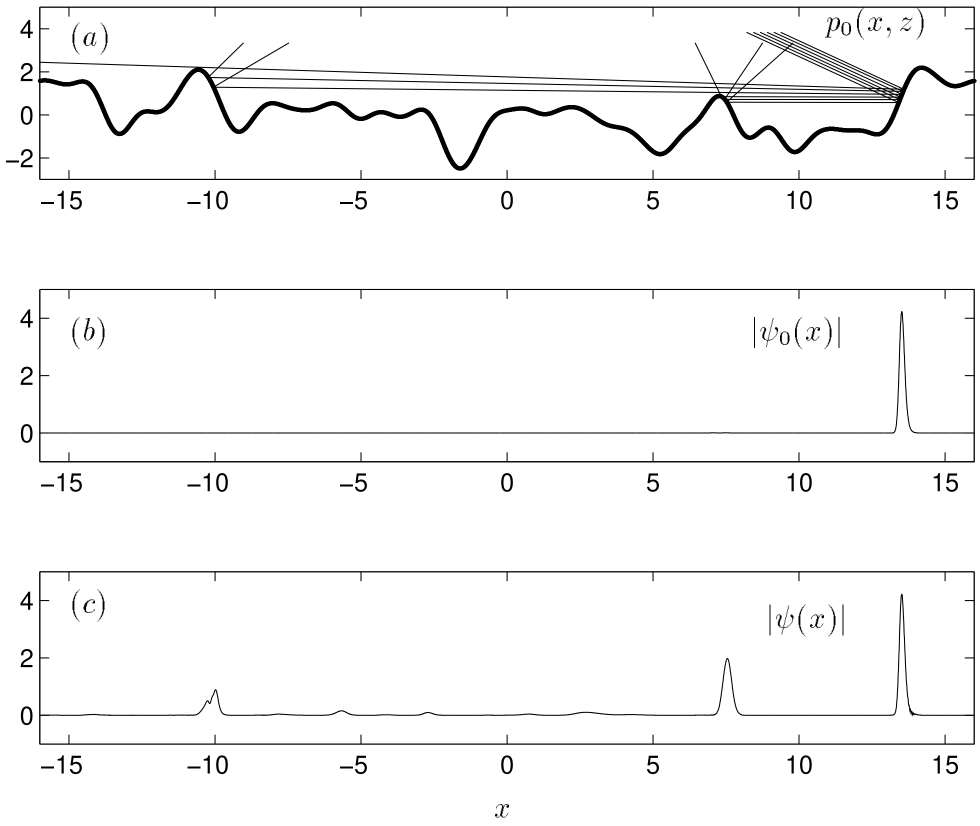

Figure 4: An example of narrow beam scattering.

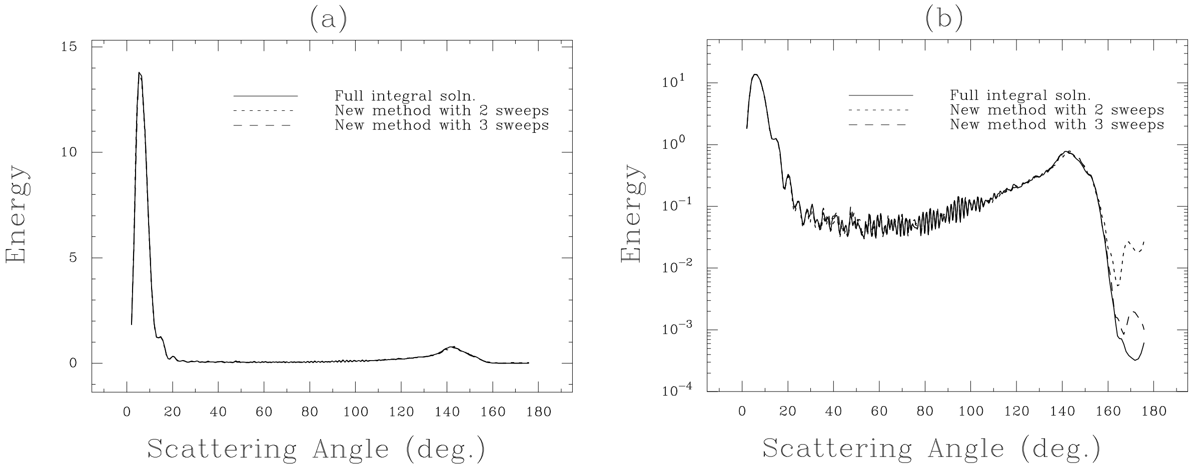

Figure 5: Comparison of the energy scattered using the full integral equation method and the new method for the surface of Fig. 4. The energy per unit scattering angle is ploted against scattering angle in (a). In (b) the same results are shown on a logarithmic scale.

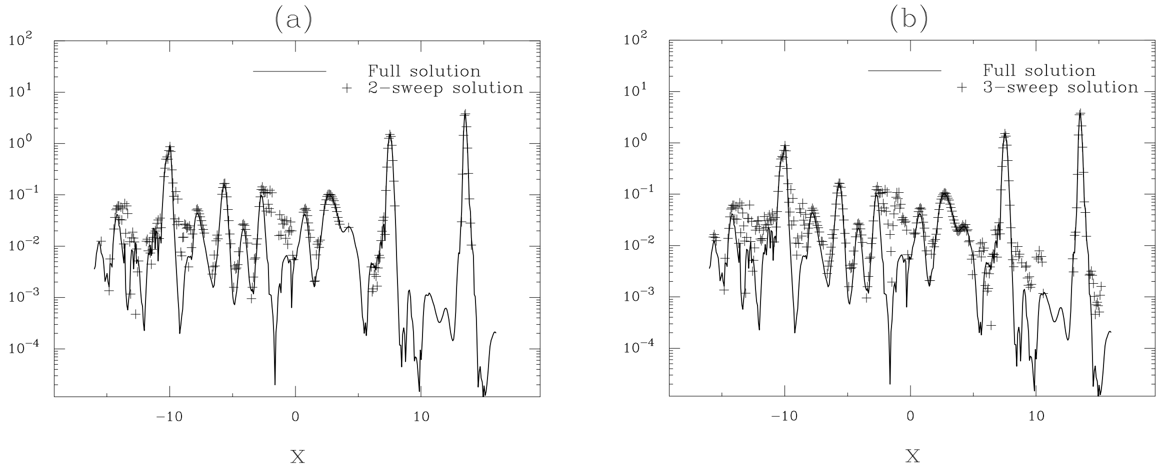

Figure 6: Plot of $|\psi|$ for the surface on Fig. 4. The full solution is compared with two sweeps of the new method in (a), and is compared with three sweeps of the new method in (b).

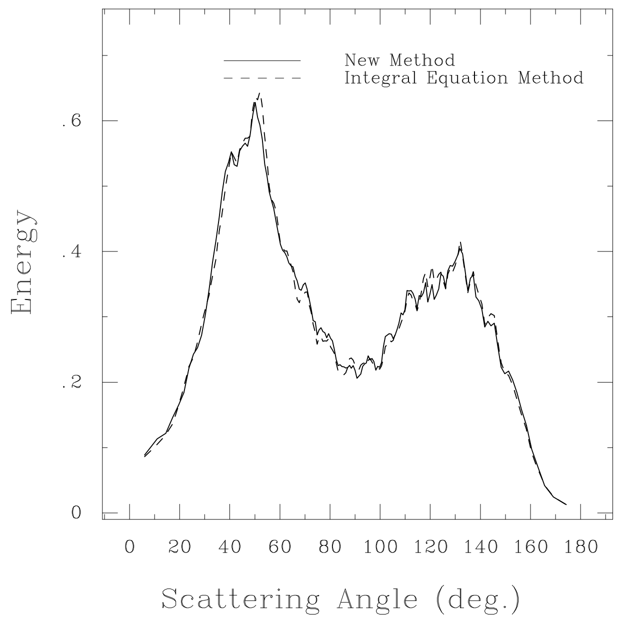

Figure 7: Comparison of the full integral equation method and the new method on 384 surface realizations ($h/l = 2.0$ and $kl = 15.0$).

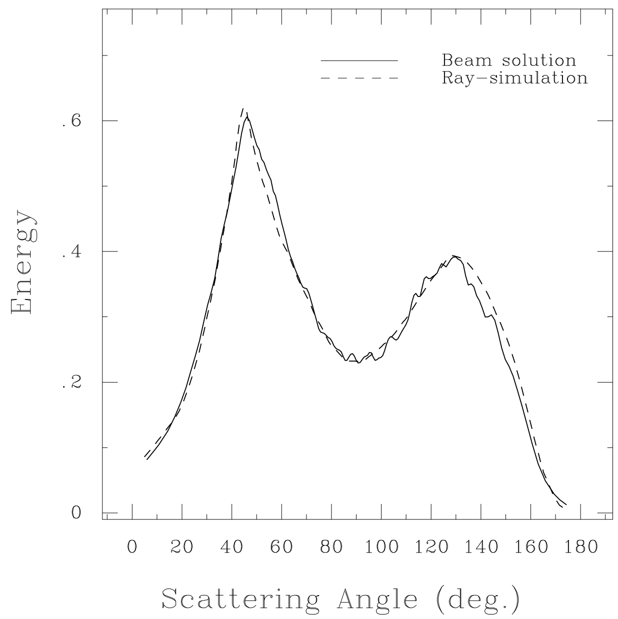

Figure 8: Comparison of the integral equation result and the ray-simulation result with the same values of the parameters as in Fig. 7.

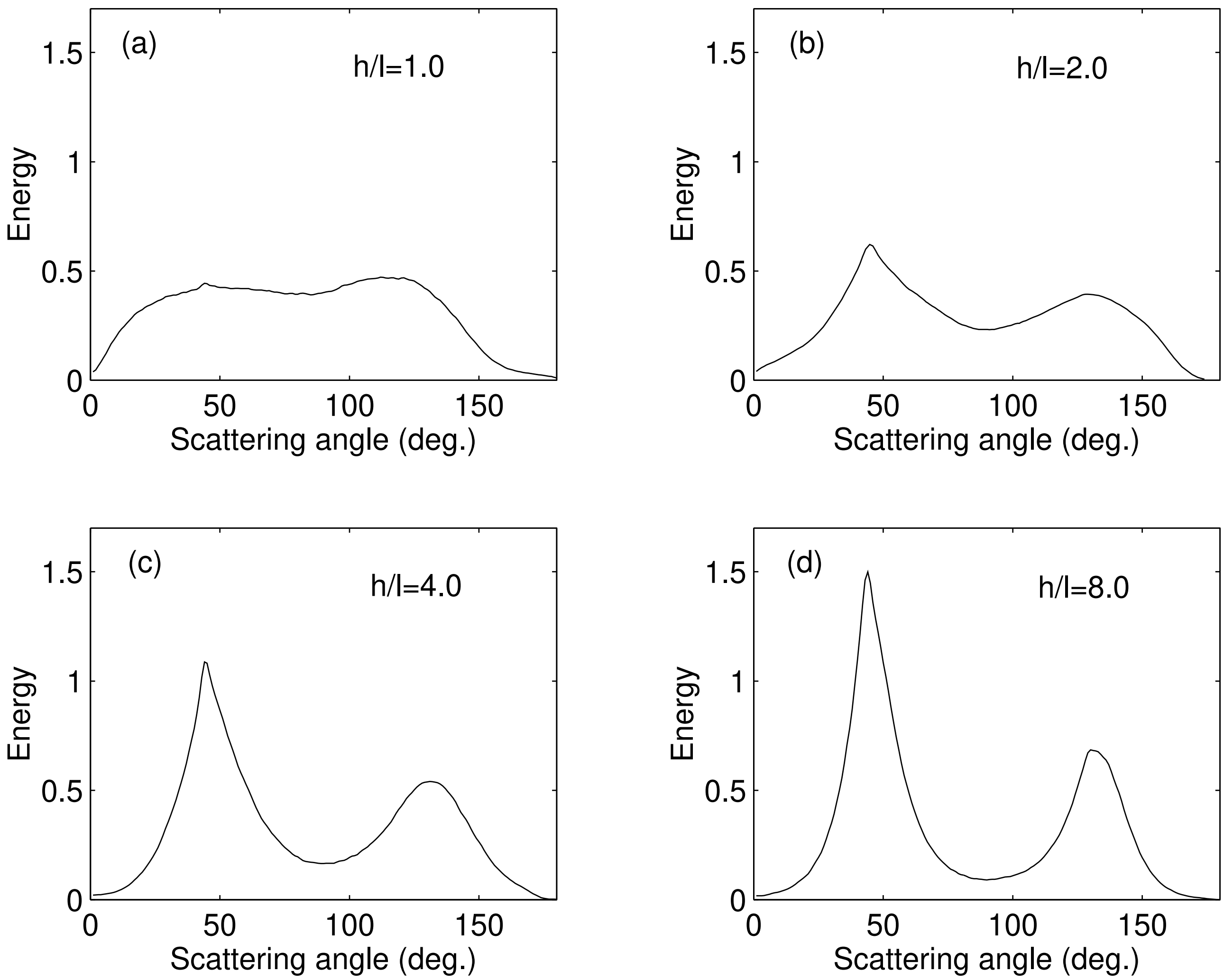

Figure 9: Comparison of the energy scattered vs scattering angle determined from ray simulations for (a) $h/l = 1.0$, (b) $h/l = 2.0$, (c) $h/l = 4.0$ and (d) $h/l = 8.0$.

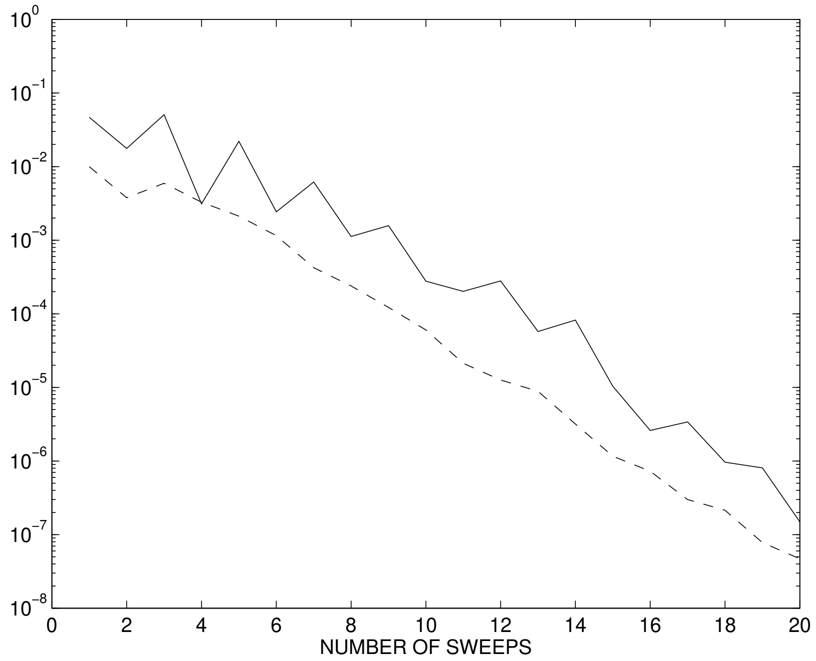

Figure 10: The measure of error $[\langle \psi_i^*, \psi_i \rangle / \max|\chi|]^{1/2}$ (see Appendix B), shown as (—–), decreases as the number of sweeps increases and this reduction is consistent with the reduction of the threshold ϵ (- - -). The result is obtained from the average of 50 surface realizations for $h/l = 2$. This indicates that convergence for the method will be achieved as $\epsilon \to 0$.

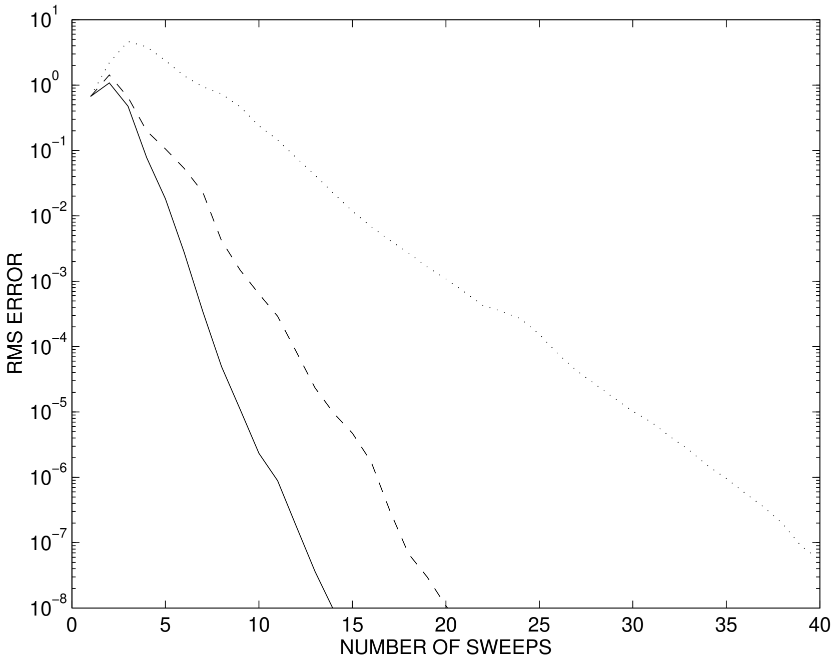

Figure 11: Comparison of RMS error $[\langle(\psi-\overline{\psi})^*,(\psi-\overline{\psi})\rangle/\langle\overline{\psi}^*,\overline{\psi}\rangle]^{1/2}$ for different values of M on a single surface with M=1024 (—–), M=512 (- - -) and M=256 (.....). Here ψ is the iterative solution defined in ALGORITHM (2f) (see Appendix B) and $\overline{\psi}$ is solution obtained by direct inversion.