

value obtained from Fig. 9 is 97.759pF/m. Furthermore, the per unit length capacitance has been measured by the static field capacitance measurement method. It uses galvanometer measured the charge of microstrip line in case of a given voltage. Then the per unit length capacitance can be obtained and the value is 97.761pF/m. So the value of capacitance is closer to the measurement when using new conformal technology.

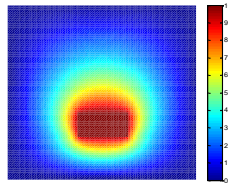


Fig. 8. The potential distribution without using conformal technique.

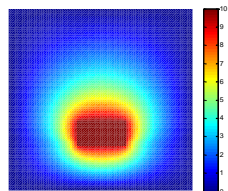


Fig. 9. The potential distribution using conformal technology.

Besides, to verify the accuracy of new method further, the average dielectric constant method has been used to calculate the capacitance of the microstrip line model in Fig. 1 (b), and the discrete grid model is shown in Fig. 10. The potential distribution using the average dielectric constant method is shown in Fig. 11, and the per unit length capacitance is 96.87pF/m. The comparative result shows that the capacitance calculated by the new method is more approximated to the measurement than the average dielectric constant method. It shows that the new method has higher precision than the average dielectric constant method.



Fig. 10. The microstrip line model using average dielectric constant method.

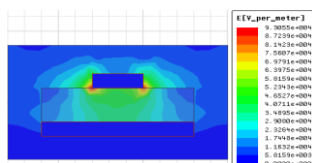


Fig. 11. The potential distribution of Fig. 10 model.

IV. CONCLUSION

A new method based on FDM has been proposed for capacitance extraction of microstrip line using conformal technique. The results show that the capacitance solved by the proposed method is close to the measurement and more accurate than traditional one. Besides, the new method can be applied to various positional relationships between dielectric interface and electric field directions. It also has a significance to the analysis and design of high speed PCB.

ACKNOWLEDGMENT

This project was supported by the National Natural Science Foundation of China (Grant No. 51209055), the China Postdoctoral Special Foundation (Grant No. 2015T80324), and the Natural Science Foundation of Heilongjiang, China (Grant No. F2015028).

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