3) The disorder degree ori_m of the SMF proposed can present the orientation of the SMF of EMSF, and the SE of the EMSF increases with an increase in the disorder degree.
4) The effectiveness of the exposure ratio, discrete mean and disorder degree parameters, which describe the SMF arrangement of the EMSF, is satisfactory. The research is valuable and provides a basis for the study of the theory and application of EMSF.

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References

1. Wang XC, Liu Z, Zhou Z, He Q, Zeng HX. Automatic identification of gray porosity and its influence on shielding effectiveness for electromagnetic shielding fabric. *Int. J. Cloth. Sci. Tech.*2014; 26(5):424-436.
2. Liu Z, Wang XC, Zhang YH, Zhou Z. Analysis of surface metal fiber arrangement of electromagnetic shielding fabric and its influence on shielding effectiveness. *Int. J. Cloth. Sci. Tech.*2016; 28(2):191-200.
3. Liu Z, Rong X, Zheng QX, Sun RL, Chen YN, Wang XC. Analysis of arrangement structure for metal fiber in blended electromagnetic shielding fabric, *2014 Progress in Electromagnetics Research Symposium (PIERS 2014)*, Aug.25-28.
4. Kazantseva NE, Ponomarenko AT, Shevchenko VG, Klason C. Magnetically textured composite materials as elements of electromagnetic wave absorbers. *Electromagnetics* 2000; 20(6):453-466.
5. Ortlek HG, Saracoglu OG, Saritas O. Electromagnetic shielding characteristics of woven fabrics made of hybrid yarns containing metal wire. *Fiber. Polym.*2012; 13(1):63-67.
6. Wang X, Liu Z, Zhou Z. Rapid computation model for accurate evaluation of electromagnetic interference shielding effectiveness of fabric with hole based on equivalent coefficient. Int. J. Appl. Electrom. 2015; 47(1):177-185.
7. Li R, Zhang L, Jia L. Influence of fabric structural model on shielding effectiveness of electromagnetic radiation shielding fabric. *Int. J. Model. Ident. Contr.*2010; 11(3/4):211-217.
8. Liu Z, Wang XC. Influence of fabric weave type on the effectiveness of electromagnetic shielding woven fabric. *J. Electro. Magnet. Wave.* 2012; 26(14/15):1848-1856.
9. Saini P, Choudhary V. Conducting polymer coated textile based multilayered shields for suppression of microwave radiations in 8.2-12.4 GHz range. *J. Appl. Polym. Sci.*2013; 129(5):2832–2839.
10. Wang XC, Liu Z, Zhou Z. Virtual metal model for fast computation of shielding effectiveness of blended electromagnetic interference shielding fabric. *Int. J. Appl. Electrom.*2014; 44(1):87-97.
11. Araneo R, Lovat G. Analysis of the shielding effectiveness of metallic enclosures excited by internal sources through an efficient Method-of-Moment approach. *Appl. Comput. Electrom.* 2010; 25(7):600-611.
12. Liu Z, Zhang YH, Rong X, Wang XC. Influence of metal fibre content of blended electromagnetic shielding fabric on shielding effectiveness considering fabric weave. *Fibres. Text. East. Eur.* 2015; 23(4):83-87.
13. Saravanja B, Malaric K, Pusic T, Ujevic D. Impact of dry cleaning on the electromagnetic shield characteristics of interlining fabric. *Fibres. Text. East. Eur.* 2015; 23(1):104-108.
14. Wang XC, Liu Z. Influence of fabric density on shielding effectiveness of electromagnetic shielding fabric. Prz. Elektrotechniczny 2012; 88(11a):236-238.
15. Ching IS, Jin TC. Effect of stainless steel-containing fabrics on electromagnetic shielding effectiveness. *Textile Res. J.* 2004; 74(1):51-54.
16. Liu Z, Wang XC. Manufacture and performance evaluation of solar garment. *J. Clean Prod.*2013; 42:96-102.
17. Koprowska J, Dobruchowska E, Reszka K, Szwugier A. Morphology and electromagnetic shielding effectiveness of PP nonwovens modified with metallic layers. *Fibres. Text. East. Eur.*2015; 23(5):84-91.
18. Wang XC, Li XJ. Recognition of fabric density with quadratic local extremum. *Int. J. Cloth. Sci. Tech.* 2012; 24(5):328-338.
19. Liu Z, Wang XC. Relation between shielding effectiveness and tightness of electromagnetic shielding fabric. *J. Ind. Text.* 2013; 43(2):302-316.
20. Liu Z, Rong X, Yang YL, Wang XC. Influence of Metal Fiber Content and Arrangement on Shielding Effectiveness for Blended Electromagnetic Shielding Fabric. *Mater. Sci-medzg.* 2015; 21(2):265-270.
21. Qian ZM, Chen ZJ. Electromagnetic compatibility design and interference suppression technology.Ed. *Zhejiang University Press*, Hangzhou, 2000.
22. Liu Z., Su Y., Li YP, Pan Z, Wang XC. Numerical calculation of shielding effectiveness of electromagnetic shielding fabric based on finite difference time domain. *Int. J. Appl. Electrom.* 2016; 50(4):593-603.

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