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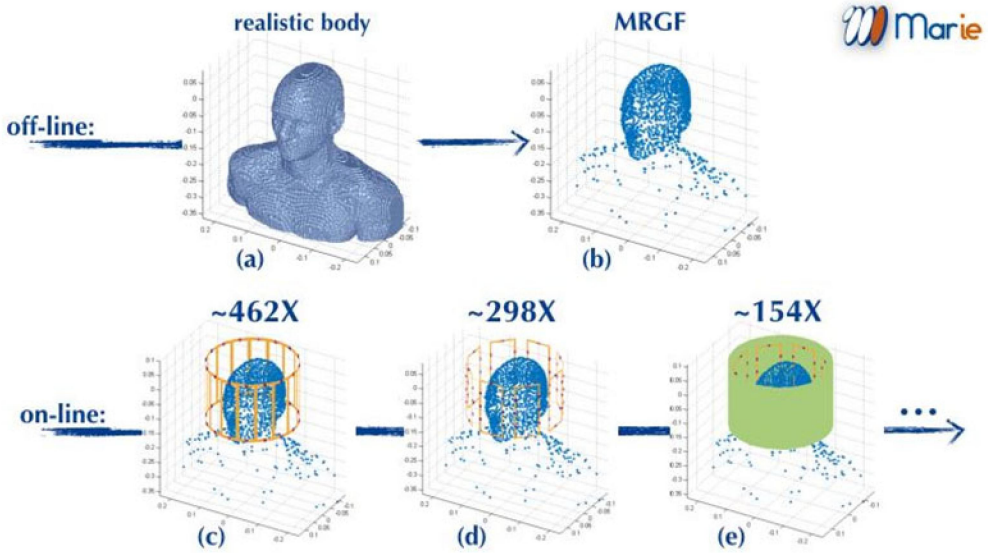
NOVEMBER 2016 VOLUME 63 NUMBER 11 IEBEAX (ISSN 0018-9294)



Magnetic resonance-specific framework based on the combination of integral equation methods and domain decomposition approaches for accelerating the numerical modeling of interactions between electromagnetic waves and biological tissue. (a) For any given realistic human body model, (b) pre-compute the magnetic resonance Green function (MRGF) via an ultrafast volume integral equations method and principal component analysis. (c)–(e) Combine the MRGF with standard surface integral equations method to model the performance of multiple transmit/receive coil configurations with more than two orders of magnitude speed-ups and negligible errors. See "Fast Electromagnetic Analysis of MRI Transmit RF Coils Based on Accelerated Integral Equation Methods," by Villena *et al.*, p. 2250.

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