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A broad-band radio attenuation model for Antarctica

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We have developed an electromagnetic attenuation model for Antarctic ice in the frequency band 1MHz - 5GHz, appropriate for experiments such as ANITA or ARA which propose to detect high energy cosmic particles via radio emission induced in the continental ice. The model incorporates a frequency model of ice conductivity dependent on local temperature and ionic impurity concentrations. Temperature profiles are taken from the current time slice of a 4D dynamical calculation by Fastook. Impurities are based on measurements by the ITASE group at 414 sites around the continent. Surface and bedrock contours are taken from the BEDMAP collaboration. A low attenuation region near 90 degree longitude and -84 degree latitude seems well suited to location of a large radio array.

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