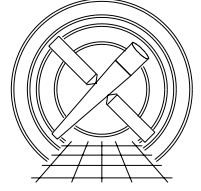




MIT
Center for Space Research



Chandra X-Ray Center

MEMORANDUM

January 24, 2005

To: Background Working Group
From: Glenn Allen, SDS
Subject: Formulation of the *Chandra* Background
Revision: 1.0
URL: http://space.mit.edu/CXC/docs/memo_background_1.0.ps
File: /nfs/cxc/h2/gea/sds/docs/memos/memo_background_1.0.tex

The count spectrum for an observation can be expressed as

$$\begin{aligned} C(i) = & \int dER(i, E, x, y, t)A(E, x, y, t)S(E, x, y, t) + \\ & \int dER(i, E, x, y, t)A(E, x, y, t)B_c(E, x, y) + \\ & \int dER(i, E, x, y, t)A(E, x, y, t)B_G(E, x, y) + \\ & \int dER(i, E, x, y, t)B_p(E, x, y, t) + \\ & \int dER(i, E, x, y, t)B_f(E, x, y, t) \end{aligned} \quad (1)$$

where $C(i)$ is the number of events in pulse-height bin i , R and A are the RMF and ARF, respectively, S is the spectrum of the observed source, B_c , B_G , B_p and B_f are the background contributions from cosmic X rays, Galactic X rays, the quiescent flux of charged particles and flares of charged particles, respectively and E , x , y and t are the energy, x coordinate, y coordinate and time respectively. No distinction between the CCD coordinates and sky coordinates is made in this representation. The two background components due to charged particles instead of X rays should not have the ARF applied.