EMP Coding and the process of iteration and loops :
An EMP project by - www.lagridcoalition.org

Iteration, in the context of computer programming, is a process wherein a set of instructions or structures are repeated in a sequence a specified number of times or until a condition is met. When the first set of instructions is executed again, it is called a iteration. When a sequence of instructions is executed in a repeated manner, it is called a loop. Iteration is the repetition of a process in a computer program, usually done with the help of **loops.** A loop is a programming function that iterates a statement or condition based on specified boundaries. The loop function uses almost identical logic and syntax in all programming languages. Thus, a specific statement or a group of instructions is continuously executed until a specific loop body or boundary condition is reached. The **result of the entire loop body's first operation cycle serves as the next repetition's** starting point.

The following text is an explanation of the work by Merlyn Cousins.
- https://github.com/drforbin/EEMP-MODELING,   This work is slight variation on the math used but the physics were not affected. Read Riemann sums; https://en.wikipedia.org/wiki/Riemann_sum
   The term **NDELR** defined below in the Thesis is the desired number of steps (iterations) to be used in the integration over r in the absorption region, is read in as any integer in the closed interval -- it can have a range of values such as 50 to 500. We used 400 & 10,000 for convergence.

In the US AF Terry Chapman Thesis -- the following data was a **base line** that we modified to obtain 50Kv/m and 100Kv/m results - plus 4 constants that we derived to get the equations to compile in Fortran. See picture below for the 4 constants that can vary a little -   See page 29 of the Thesis.
   X = 0 meters,   -- Y= 0 meters, -- Z = 0 meters,   HOB = 100 km   (no changes made)
   B_ =2(10) -5 wb/m squared (no changes made) &   Dip Angle = 20° (no changes made) &
   TMAX = 20 shakes (no changes made) Also no changes made to the previously established 4 variables:
   But: **NDELR** = 50 (changes were made)   - y = .001 kt (**changes were made**)

The following statements are made by the author of EEMP-Modeling
1.) Mainly I added a function which writes the data to a file which then can be used in such programs as GNUplot for example to draw a plot.
2.) I cleaned up the code (i.e. comment OCR errors).
3.) As for largest change. Since the code was originally written to run on a CDC 6600 super computer (at the time) the iteration number (NDLER) of the interval was set to 50.

I have increased this to 400 iterations & .25 KT to yield 50,000 V/m.
The next trial on GitHub used 10,000 iterations 1kT and yield of 100,000 V/m.
   With this increased iteration number the model converges rather than diverges. Please note that the there is no ANTI-derivative for the integral so there is no closed form solution. This is why a numerical approximation is required. The thesis states that the model should be valid for a blast up to 1 Kiloton.
Merlyn Cousins

AP,	BP,	RNP,	TOP -- are the non-specified variables to compile.
2.2	0.25	6.62603	2.24 -- or use the following 4 variable inputs
1.7	2.8	1.6	1.20 - - & found by the Technical & Data Teams

The **Gerald C. Pomranning constants** Alpha, Beta, and N and Ro are not calculated in the thesis.
See **ISBN 0-486-44599-2** by Dover publications for methods of calculations/