SHAW'S
PIONEERS SINCE 1831

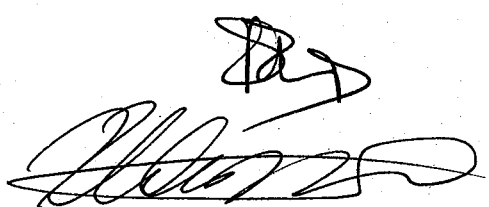
Stochastic
Project notebook #2.

Names

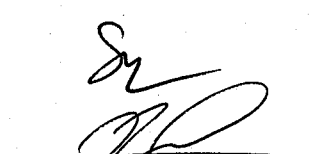
Sitakanta Mohanty

Amvrossios Bagtzoglou

Signatures



Initials



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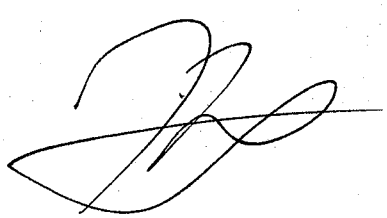
All work is described in the Project Plan.



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2/26/93

Bugs in the module relprmvg1.f were identified and taken care of. Test case was run w/ $C_1 = 1.0$, $C_2 = 0.1$ $\alpha_1 = \alpha_2 = 0.025$ $\beta_1 = 0.1$, $\beta_2 = 0.01$, xn = 3.7, ainc = 0.001

When soer step increaments in saturation was changed for soe1 to soe2 ~~after~~ soe1 approach 0, same results in rkw1 & rkw2 were obtained at two steps. That was fixed.

Test cases were also run with $C_1, \alpha_1, \beta_1 > C_2, \alpha_2, \beta_2$ We decided that it is better to keep $C_1, \alpha_1, \beta_1 < C_2, \alpha_2, \beta_2$

3/1/93 Module relprmvg4.f (a refined version of relprmvg1.f) was incorporated into the code fracvar3.f that determines unsat conductivity after generating the fracture system. Relprmvg4.f is capable of calculating unsat. conductivity of binary systems only. Therefore fracvar3.f give the warning that it can calculate only for binary ~~sys~~ conductivity field

3/2/93 fracvar3.f was upgraded to fracvar4.f to see if all variables are compatible ~~for~~ with implicit double precision. The Fortran compiler is an old one and can not produce double precision random numbers using randu.f.

~~f~~ relprmdist1.f was created to calculate unsat conductivity for a dist. of matrix conductivity (satk). This implement method A (see prog)

3/3/93 relprmdist1.f was modified to relprmdist2.f to implement method B (see program).

3/4/93 Bugs in relprmdist1.f & relprmdist2 were fixed. Fine intervals were taken in avg saturation (Soemin) ~~..~~ (in ..dist2.f) & Soemin (minimum prm) (in (...dist1.f) to get the whole range of relationship between Soe & Rwk-e.

3/5/93 • relprmdist1.f module was combined with the main program ~~for~~ fracvar3.f —new→ fracvar5.f

• Changes were made to relprmdist1.f to ~~incorporate~~ generate files with (for satd.k, alfa & beta arrays) which later would be used as input files to BIGFLOW.

Pages 3 and 4 Are Intentionally Left Blank

3/25 Running program mdmf under the title mdmv.f. input files INPUT & INDAT.

- Gives segmentation violation problem when a field of size 16x16x16 is used on sebastian
- Therefore, currently I ~~tried~~ am trying it on ~~the~~ vax 8700.

3/26 PORFLOW version 2.4.1 was tested on Sparc machine (sebastian). The particular version that was used did not reproduce the results for prob1 in the manual (NUREG/CR-5991)

Need to get a new version and test it on VAX before transferring to Sparc. The above problem may answer questions regarding the strange answers we are obtaining on a one-D unsat flow problem

work done for Gordon

3/26 A code "variogram3d.f" was developed to determine the variograms in three different directions of a 3-D field. This is a modification of variogram2d.f which was formerly named as variogram.f. The field was generated by using GSLIB program tb3dm.f (a turning bad method).

The data were specified for a 32x32x32 size field, with an isotropic correlation length = 16. Nugget = 0. The correlation lengths determined by the program "variogram3d.f" were very close to 16 though they were slightly different in different directions as one would expect.

4/19/93 & 4/20/93

Fracture generator code fracvar6.f was modified: the program now can create the alfa, beta & ksat files for any matrix-fracture composite. Previously it was doing it only for a distribution of matrix conductivities in the subroutine relpmdist2. A subroutine was also added to generate the headerfile for BIGFLOW files mentioned above. Ashok is supposed to add the exact format to the header file. The α, β values for the homogeneous background now can be assigned in the main program. The bug in the postscript file generator of fracvar6.f has also been fixed.

4/26/93 — 4/30/93

2-D nnm2d.f and nnm2da.f codes were written to be able to use nnm method on a using regular fortran. The approach of Baker was used. The programs are not complete yet. The programs can handle conditioning points.

Pages 1 through 7 of this Scientific Notebook were reviewed for compliance with QAP-001 in response to Corrective Action Request 94-02. Corrections and clarifications were made as appropriate. In some cases, the date of a change will reflect the date of this review rather than the date of the original Scientific Notebook entry.

Randy Todd
SWRI-QA
12/09/94

Project was closed December 1994 because it reached completion.

12/14/94

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