INVERSE HEAT CONDUCTION Ill-posed Problems

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Heat conduction Matlab function for the X22B10T0 case: **fdX22B10T0.m**

Syntax

```
fdX22B10T0(xd,td,A)
```

Description

fdX22B10T0 (*xd*, *td*, *A*) returns the dimensionless temperature *Td* at a given dimensionless location *xd* from the heated surface, between 0 and 1, and at a given dimensionless time *td*, with an accuracy of 10^{-A} (*A* = 2, 3, …, 15) with respect to the maximum temperature rise that occurs at *xd* = 0 and time *td*, for the X22B10T0 problem.

If *xd* and *td* are not single values but arrays (length(*xd*) = *n* and length(*td*) = *m*) defining the dimensionless locations and times of interest, respectively, the above function returns the dimensionless temperature *Td* as double subscripted arrays, where size(*Td*) = [*m*, *n*].

Examples

Example 1

```
>> Td=fdX22B10T0(.25,.1,10)

Td =

   0.161180315836933
```

Example 2

```
>> fdX22B10T0(.25,.1,10)

ans =
```

```
   0.161180315836933
```

Example 3

```
>> A=15

A =

    15

>> xd=[0 0.5 0.7]'

xd =

                   0
   0.500000000000000
   0.700000000000000

>> td=[0.01 0.2]'

td =

   0.010000000000000
   0.200000000000000

>> Td=fdX22B10T0(xd,td,A)

Td =

   0.112837916709551   0.000014352414313   0.000000019773817
   0.505165188702561   0.158352196668220   0.094884894165447
```