

**DSurfTomo , 十年**

# 证据

USTC | mail      Hongjian Fang <fanghj@mail.ustc.edu.cn>    Self-service - Lock Screen      Option

Welcome    Inbox    Search    基于网格点...    webpage for ...

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Contacts  
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**基于网格点的频散曲线正演程序**    📄    🗑    🖨    New Meeting

From :    Hongjian... <fanghj@mail.ustc.edu.cn>

Time :    21:48:02 Dec 30, 2013 (Monday)

To :    Huajian ... <hjyao@ustc.edu.cn>

📧 Sent State: Has been read.    [Show detail]

姚老师,  
老师您好。上次你给我的程序好像只有层状介质的频散曲线正演程序, 老师您那里有基于网格点的吗? 候用简单的差分就可以了是吧, 这个敏感核的计算是假定每个网格点下面速度模型是一维的吗?  
洪建

# How it got started

.2013-2014 : 姚老师的想法 , FM Tomo, Coding and testing (many unslept nights) → DSurfTomo0.1

.2015: DSurfTomo1.0

.2016: Bsjointinversion

.Since 2016, DAzimSurfTomo, DradSurfTomo, many applications

Now: DSurfTomo1.4

# Contents

Codes intro + how to use

Frequently asked questions

My experience

**Hear your voice**

# Codes \*

./src: Source codes

./docs: Manual

./bin: Executable DSurfTomo

./example: Data example in Taipei Basin

./scripts: Some scripts for data reformatting,  
plotting

# How to use DsurfTomo \*

- .Compile DsurfTomo, go through the data example
- .Data preparation: Raw → Cross-Correlation → Dispersion → Reformat → 'DisperData.dat'
- .Prepare the Input file
- .Run `../bin/DsurfTomo DsurfTomo.in`

# FAQs via emails

The screenshot shows a Gmail interface with a search filter for 'DSurfTomo'. The search results are displayed in a list format, with the following details:

- Search Filters:** From, Any time, Has attachment, To, Is unread, Advanced search.
- Page Indicator:** 101-142 of 142 (highlighted with a purple box).
- Email List:**
  - Inbox 关于DSurfTomo-stable 程序的两个问题 - 在应用DSurfTomo-stable程序反演中... 12/20/18
  - Inbox 关于DSurfTomo的一个小问题 - 你的DSurfTomo在做检测板测试, 我看了你201... 9/11/18
  - Inbox SUPPORT ON JOINT INVERSION OF PHASE AND GROUP SV VELOCITIES USIN... 9/3/18
  - Inbox 關於DSurfTomo - 演程式DSurfTomo, 遇到了一些問題想請教你。 >> 關於chec... 8/22/18
  - Inbox 师兄, 请教关于DSurfTomo的问题 - 请教关于DSurfTomo的问题一般weight取... 7/21/18
  - Inbox [HongjianFang/DSurfTomo] fix typo (#3) - . Reply to this email directly or vie... 7/14/18
  - Inbox DSurfTomo - HongjianFang/DSurfTomo.I suggest read the >> manual before r... 7/13/18
  - Inbox Software Licensing - use the DSurfTomo program and your name in my publi... 7/10/18
  - Inbox DSurfTomo - I got DSurfTomo.inSyn, velmap2dRg, Vs\_model.real files. Do the ... 6/23/18
  - Inbox 關於SurfTomo - HongjianFang/DSurfTomo。 >>>> >>>> 祝好, >>>> 洪健>>>> ... 6/1/18
  - Inbox Example to use Love and Rayleigh wave phase vel. simultaneously using Dsurf... 5/17/18

# Issues on GitHub

Navigation bar for the repository **HongjianFang / DSurfTomo**. It includes a search bar with the text "Type / to search", a user profile picture, and a menu of repository features: Code, Issues (highlighted), Pull requests, Actions, Projects, Wiki, Security, Insights, and Settings.

Filter and action bar. On the left, a "Filters" dropdown is followed by a search input containing "is:issue is:closed". On the right, there are buttons for "Labels 7" and "Milestones 0", and a prominent green "New issue" button.

Clear current search query, filters, and sorts

<input type="checkbox"/>	0 Open	✓ 7 Closed	Author	Label	Projects	Milestones	Assignee	Sort
<input type="checkbox"/>	✓	<b>Fortran runtime error: Index '23' of dimension 2 of array 'scxf' above upper bound of 22</b>						3
		<small>#10 by Aki-halas was closed now</small>						
<input type="checkbox"/>	✓	<b>Unable to open the input file</b>						2
		<small>#9 by chinu739 was closed on Dec 2, 2021</small>						
<input type="checkbox"/>	✓	<b>No 'raypath.out' in output files</b>						2
		<small>#8 by MrXiaoXiao was closed on Sep 7, 2020</small>						
<input type="checkbox"/>	✓	<b>error in computing sensitivity matrix</b>						4
		<small>#7 by asadeghib was closed on Mar 25, 2021</small>						
<input type="checkbox"/>	✓	<b>What might cause it that the absolute velocity of the inversion cannot converge to a reasonable range ?</b>						1
		<small>#6 by LevCarlo was closed on Apr 17, 2020</small>						
<input type="checkbox"/>	✓	<b>代码使用垂询</b>						2



**MFAQs**

# How to set the boundaries right

DsurfTomo(v1.3)使用咨询 ▷ Inbox ×



Mon, Dec 26, 2022, 11:46 AM



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您好，[redacted]用DsurfTomo(v1.3)处理基于姚华建老师的matlab程序提取出的瑞雷波的群/相速度频散曲线，在进行群速度反演时正常使用，但利用[redacted]次处理中生成surfdata.txt的脚本一致，两个的经纬度网格一致，应该不存在经纬度颠倒的情况，之前使用中这种报错一般指的是网格划分范围不对，会显示具体的经纬度信息，但在这个报错中，给出的是"90.0000000 0.00000000"，所以想咨询一下您这种报错是哪里有问题，麻烦您百忙之中给予回复。

报错信息：

```
computing sensitivity matrix...
```

```
Rayleigh wave phase velocity depth kernel
```

```
Source lies outside bounds of model (lat,long)= 90.0000000 0.00000000
```

```
TERMINATING PROGRAM!!!
```

```
Note: The following floating-point exceptions are signalling: IEEE_UNDERFLOW_FLAG IEEE_DENORMAL
```

# How to choose the 'weight' and 'damp'

在程序运行时，DSurfTomo.in.log文件中总是会不断出现提示，并且并不向下运行

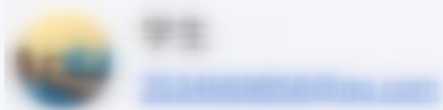
improper initial value in disper - no zero found in fundamental mode

This may be due to low velocity zone causing reverse phase velocity dispersion, and mode jumping.

due to looking for Love waves in a halfspace which is OK if there are Rayleigh data.

If reverse dispersion is the problem, Get present model using OPTION 28, edit sobs.d,Rerun with onel large than 2 which is the default

这种原因的出现，是因为我所使用的初始模型中存在40Km处的两个低速层的原因吗？非常希望能够得到方老师的解答




# How to choose “sparsefrac”

请教方老师关于DSurfTomo-stable报错 DSurfTomo-stable报错 Inbox x



 Ma

 Chinese ▾ > English ▾ [Translate message](#)

方老师您好，

跑DSurfTomo-stable的时候报错，麻烦您指点，台站数是295个，初始模型生成后我没有修改数值有点大（不知道会不会影响报错）。

At line 428 of file main.f90

Fortran runtime error: Array reference out of bounds for array 'iw', upper bound of dimension 1 exceeded (2 > -1615651071)

# How to set “threshold”



Hey, dear Dr. Fang,

Sorry to bother you

here I am running your code `DSurftomo`, which is fascinating code!

But here I find the many ForwardT equal to 0 in the residual files, do you know what is the potential reason for this?

# How to plot ray paths

DSurfTomo咨询 ➤ Inbox x



DSurfTomo  
10:00 AM

🌐 Chinese ▾ > English ▾ [Translate message](#)

方老师:

我从github上下载了你的DSurfTomo，在运行中有两个问题向您请教一下。

- (1) 查看了原代码，上传的程序找不到“raypath.out”相关输出内容；
- (2) 如何实现相速度、群速度联合反演？

期待您的回复！

# How to set model dimension

[HongjianFang/DSurfTomo] error in computing sensitivity matrix (#7) 🔍 Inbox x



**HongjianFang**  
@hongjianfang

Wed, Sep 2, 2020, 5:16 PM



I am using **DSurfTomo** (v1.3) to invert 112422 Rayleigh phase velocity measurements. First I encountered this error:

Index '201' of dimension 1 of array 'rthk' above upper bound of 200

So I increased the 200 default values of the NL and NLAY parameters to 300 in `curfdiop06.f` and `CalSurfC.f00`.

Now I get this error while the code tries to compute sensitivity matrix:

```
DSurfTomo(55526,0x114dc1dc0) malloc: Region cookie corrupted for region 0x7fdbdf600000 (value is bd8fbf3f)
```

```
DSurfTomo(55526,0x114dc1dc0) malloc: *** set a breakpoint in malloc_error_break to debug
```

Program received signal SIGABRT: Process abort signal.

Backtrace for this error:

```
#0 0x10818872c
```

```
#1 0x108187ad3
```

```
#2 0x7fff673c042c
```

```
Abort trap: 6
```

## Too many layers

# Huge dispersion data set



Thu, Apr 14, 2022, 2:11PM



message

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研究的课题的是与背景噪声相关的课题，使用了姚华建老师和您团队等人提供的面波频散提取软件和瑞利面波直接反演程序，在次过程中遇到一些问题，向您请教，忘您能抽出宝贵的时间答疑解惑。

反演情况及所遇到的报错，不知道报错是什么原因。

```
Fan304@fan304-Vostro-3670:~/JS-AH/surftomo/VC_rv/DSurfTomo/66*66*17/3-52km/real/1.1Vc_15%/1.1Vc_15%_4.0$ /home/f
an304/soft/surftomo_pub/bin/DSurfTomo DSurfTomo.in

      S U R F   T O M O
PLEASE contact Hongjain Fang (fanghj@mail.ustc.edu.cn) if you find any bug

model origin:latitude,longitude
 37.2170  113.6000
grid spacing:latitude,longitude
 0.1390   0.1380
model dimension:nx,ny,nz
 66  66  17
Rayleigh wave phase velocity used,periods:(s)
 3.00  4.00  5.00  6.00  7.00  8.00  9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00 18.00 19.00 20.00 21.
00 22.00 23.00 24.00 25.00 26.00 27.00 28.00 29.00 30.00 31.00 32.00 33.00 34.00 35.00 36.00 37.00 38.00 39.00 4
1.00
number of all measurements 215558
grid points in depth direction:(km)
 3.00  6.00  9.00 12.00 15.00 18.00 21.00 24.00 27.00 30.00 33.00 36.00 39.00 42.00 45.00 48.00 52.00
computing sensitivity matrix...

Program received signal SIGSEGV: Segmentation fault - invalid memory reference.
```

Working on it



# What's new this year

## GenerateDSurfTomoInput.py

- Output surfdata.dat
- Output DsurfTomo.in

还是需要根据自己的情况修改一些参数

# My experience

Run it once to get a feeling

Tuning some parameters, damping, smoothing

Synthetic tests

...

L\_curve is useful, but not always necessary, and sometimes doesn't work well...

# The way forward

Finite frequency

Flexible parameterization using Poisson Voronoi cells

More applications

Python version?

**We would like to HEAR your  
thoughts**

**方洪健：中山大学**

[fanghj23@mail.sysu.edu.c](mailto:fanghj23@mail.sysu.edu.cn)

[n](mailto:fanghj23@mail.sysu.edu.cn)