

# Profile\_Corelli\_parameterSpace

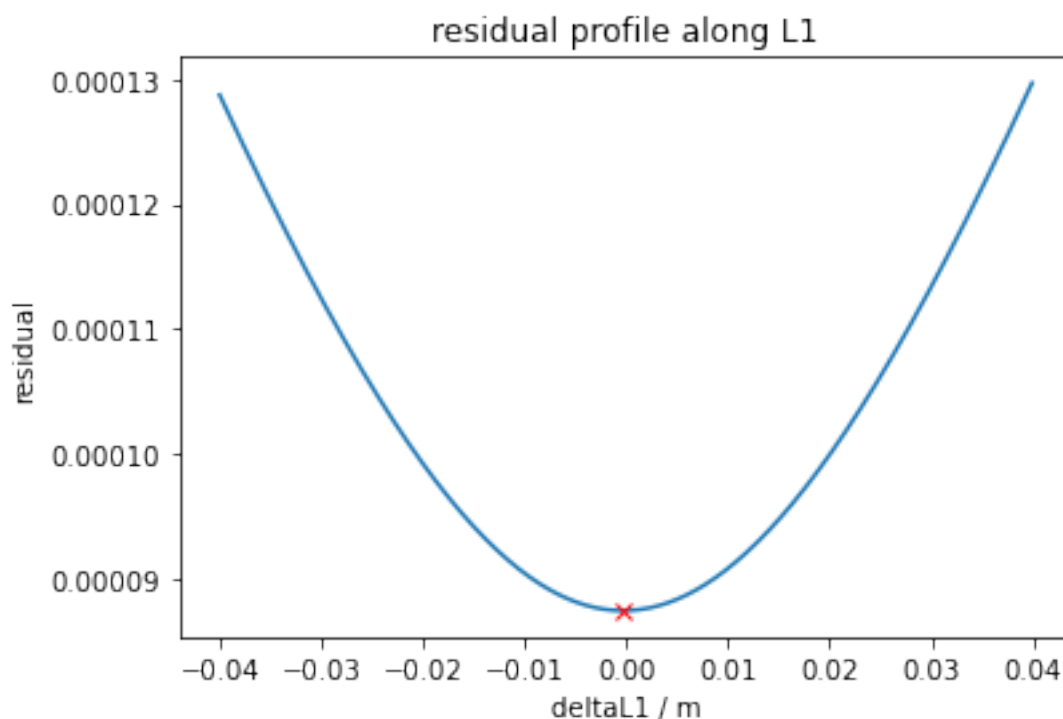
April 27, 2021

## 1 Profiling moderator (L1)

Using synthetic data generated with `mantid.predictPeaks` assuming an ideal Corelli Instrument. The profile of the moderator is the easiest one to get since it is - single var - using all peaks (~1000)

Minimum@

	dL1	residual
397	-0.0003	0.000087



For an ideal synthetic data, we are expecting  $dL1=0$  with  $residual=0.0$  if all qvectors are properly stored with any perturbation. The reality is that the current data structure (peak and peak workspace) in Mantid will introduce a 0.3mm error right from start even with an ideal dataset. In other words, the numerical limit of the current `SCDCalibratePanels` is 0.5mm and any number reported below or close to this should not be trusted.

## 2 Profiling for individual banks

The total number of freedom for the calibration of Corelli bank is 6, including - translation along x, y, z - rigid body rotation represented as Rodrigues vector - the rotation axis is represented as polar coordinates, (theta, phi) in radians. - the rotation angle is represented as a single float in degrees.

### 2.1 Translation only

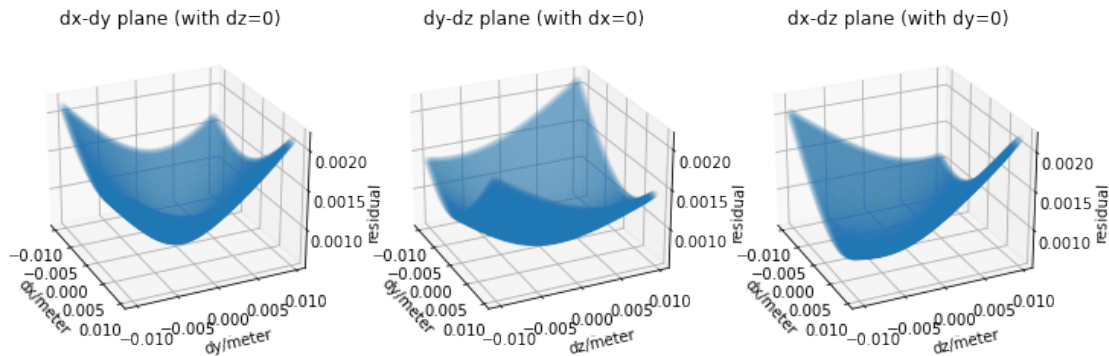
If we only allow the bank to translate, the parameter space can be characterized by three surface plot - dx-dy (dz=0) - dy-dz (dx=0) - dx-dz (dy=0)

This section provides the results for banks in CORELLI instrument.

#### 2.1.1 bank1

Global minimum is at:

	dx	dy	dz	theta	phi	rogang	residual
485149	-0.0004	0.0002	-0.0002	0	0	0	0.000613



#### 2.1.2 bank2

#### 2.1.3 bank3

#### 2.1.4 bank4

#### 2.1.5 bank5

#### 2.1.6 bank6

#### 2.1.7 bank7

#### 2.1.8 bank8

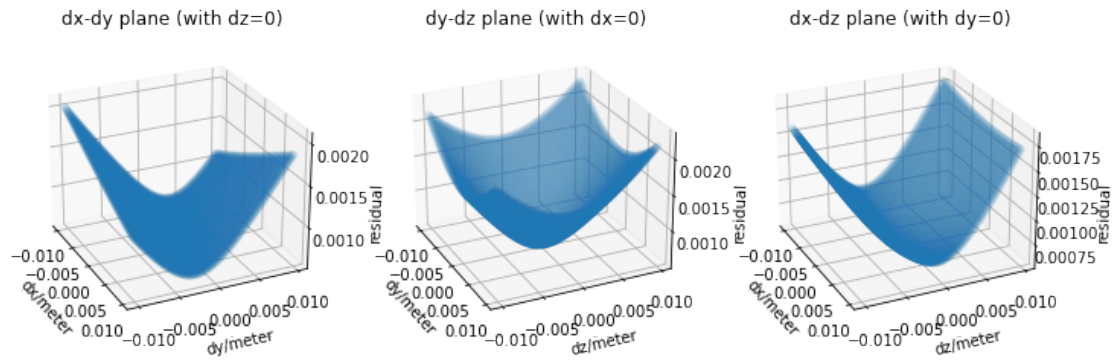
#### 2.1.9 bank9

#### 2.1.10 bank10

Global minimum is at:

	dx	dy	dz	theta	phi	rogang	residual
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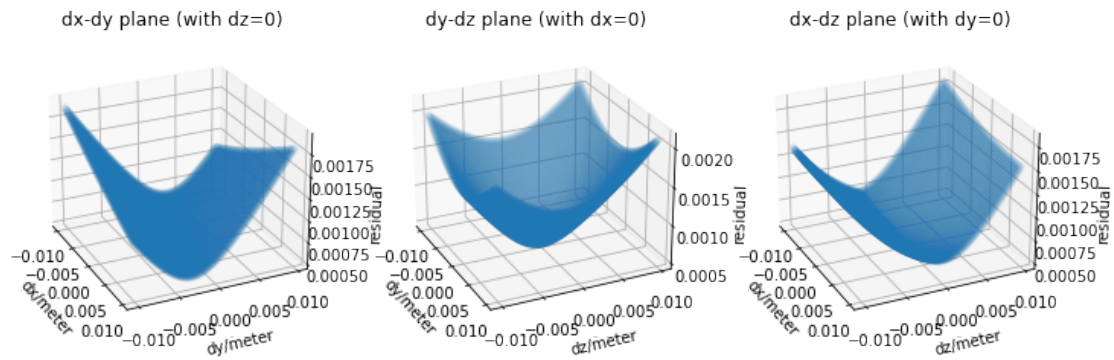
455446 -0.001 0.0008 -0.0008 0 0 0 0.000591



### 2.1.11 bank11

Global minimum is at:

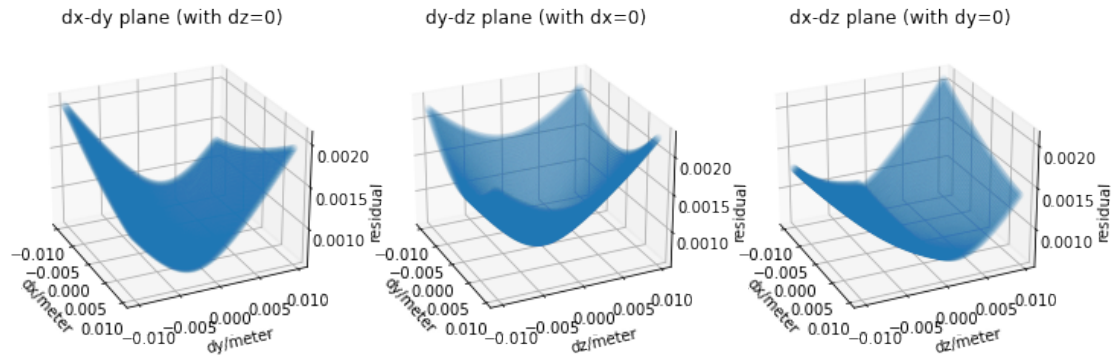
	dx	dy	dz	theta	phi	rogang	residual
535046	0.0006	-4.878910e-19	-0.0008	0	0	0	0.000539



### 2.1.12 bank12

Global minimum is at:

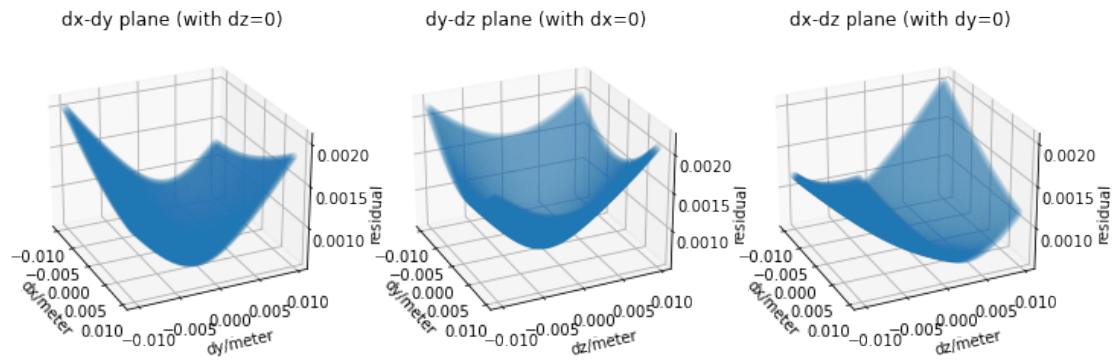
	dx	dy	dz	theta	phi	rogang	residual
475246	-0.0006	0.0004	-0.0008	0	0	0	0.000637



### 2.1.13 bank13

Global minimum is at:

	dx	dy	dz	theta	phi	rogang	residual
465447	-0.0008	0.0008	-0.0006	0	0	0	0.000601



### 2.1.14 bank14

### 2.1.15 bank15

### 2.1.16 bank16

### 2.1.17 bank17

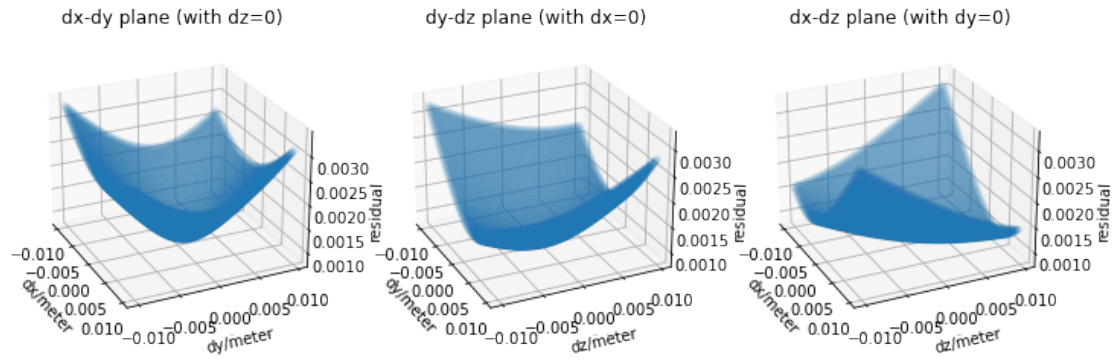
### 2.1.18 bank18

### 2.1.19 bank19

### 2.1.20 bank20

Global minimum is at:

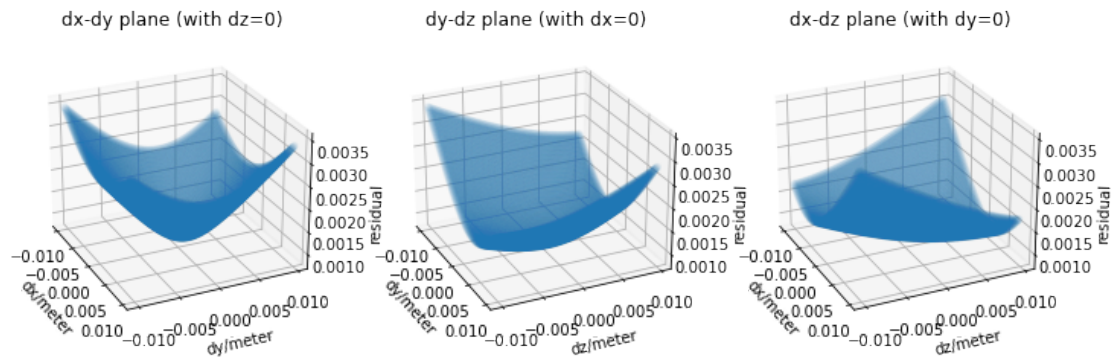
	dx	dy	dz	theta	phi	rogang	residual
475547	-0.0006	0.001	-0.0006	0	0	0	0.000896



### 2.1.21 bank21

Global minimum is at:

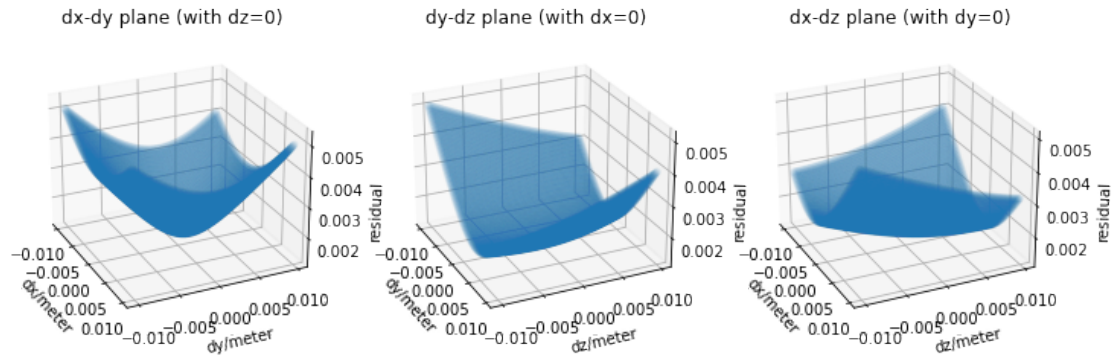
	dx	dy	dz	theta	phi	rogang	residual
465551	-0.0008	0.001	0.0002	0	0	0	0.000874



### 2.1.22 bank22

Global minimum is at:

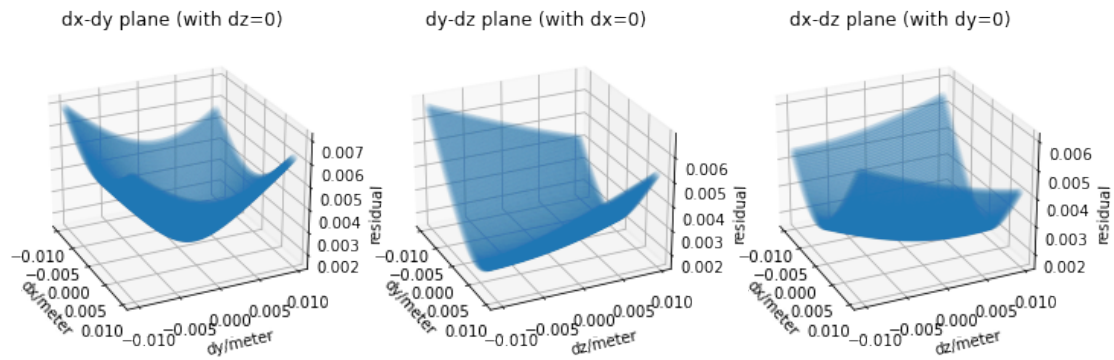
	dx	dy	dz	theta	phi	rogang	residual
416041	-0.0018	0.002	-0.0018	0	0	0	0.001339



### 2.1.23 bank23

Global minimum is at:

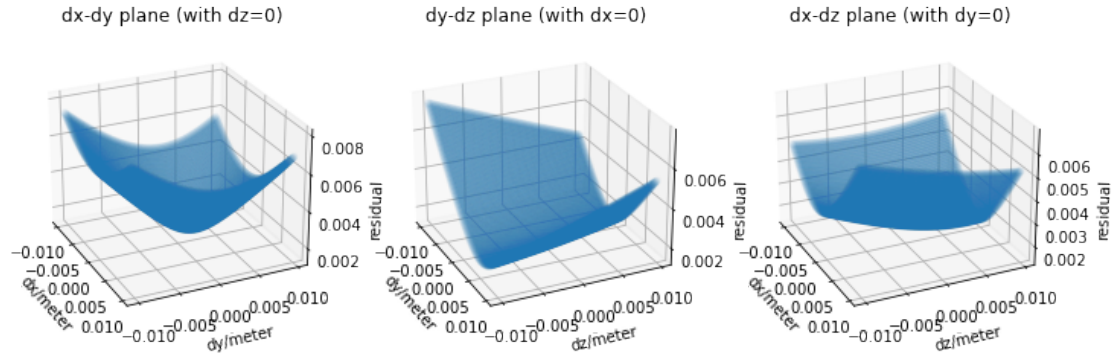
	dx	dy	dz	theta	phi	rogang	residual
446431	-0.0012	0.0028	-0.0038	0	0	0	0.001745



### 2.1.24 bank24

Global minimum is at:

	dx	dy	dz	theta	phi	rogang	residual
465374	-0.0008	0.0006	0.0048	0	0	0	0.001582



2.1.25 bank25

2.1.26 bank26

2.1.27 bank27

2.1.28 bank28

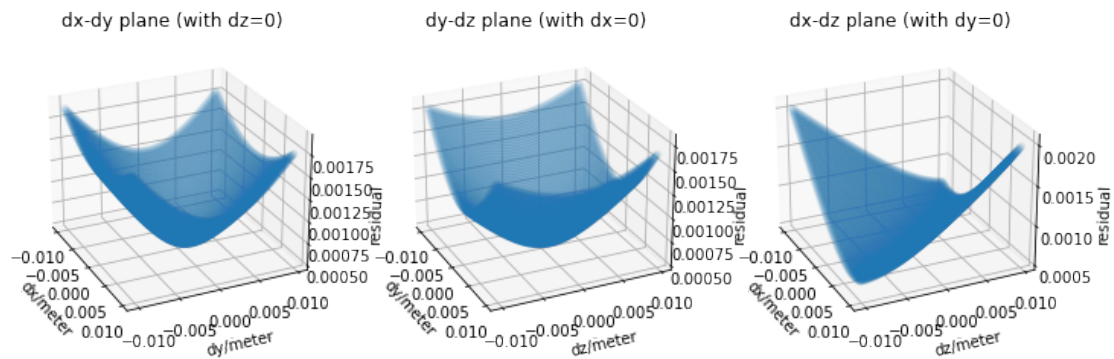
2.1.29 bank29

2.1.30 bank30

2.1.31 bank31

Global minimum is at:

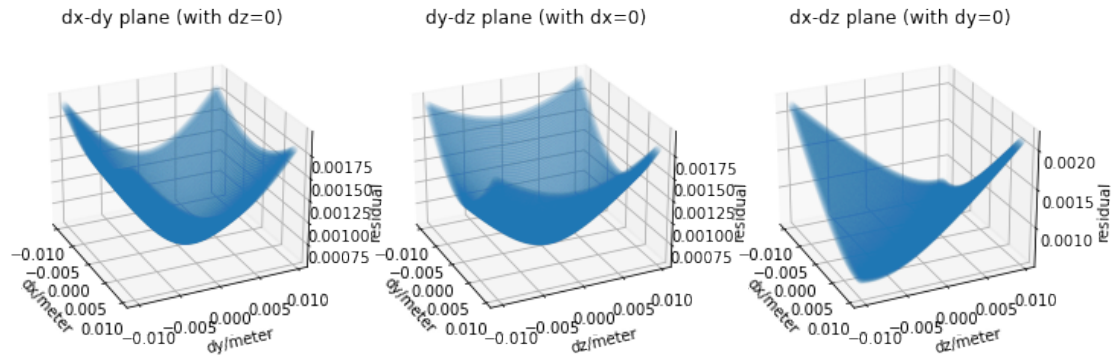
	dx	dy	dz	theta	phi	rogang	residual
495252	-0.0002	0.0004	0.0004	0	0	0	0.000548



2.1.32 bank32

Global minimum is at:

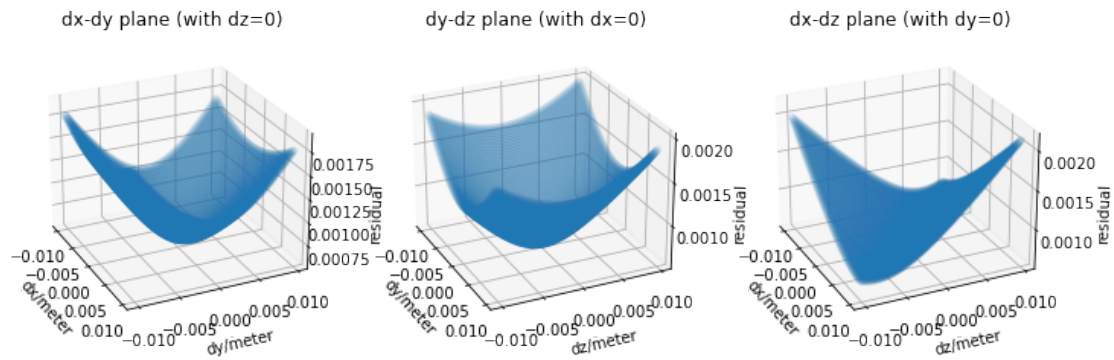
	dx	dy	dz	theta	phi	rogang	residual
475253	-0.0006	0.0004	0.0006	0	0	0	0.000594



### 2.1.33 bank33

Global minimum is at:

	dx	dy	dz	theta	phi	rogang	residual
435252	-0.0014	0.0004	0.0004	0	0	0	0.000597

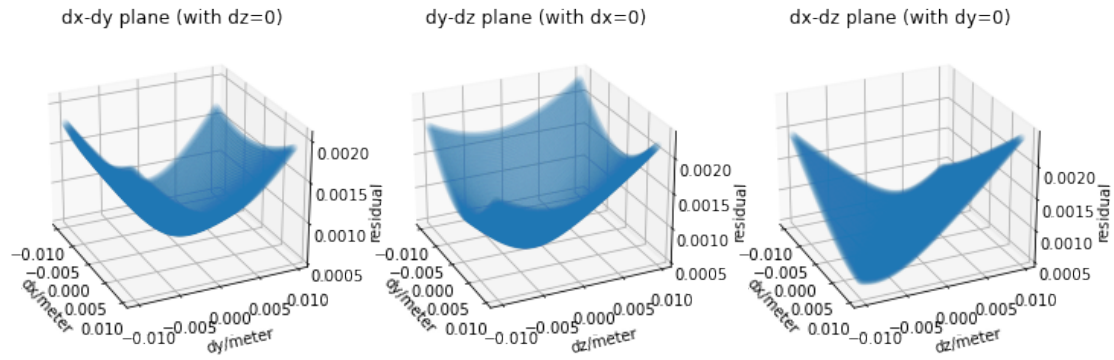


### 2.1.34 bank34

Global minimum is at:

	dx	dy	dz	theta	phi	rogang	residual
435244	-0.0014	0.0004	-0.0012	0	0	0	0.000558

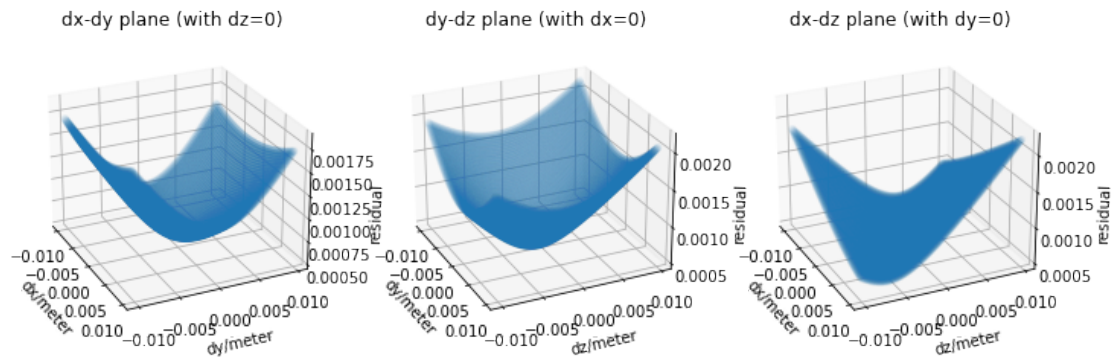




### 2.1.35 bank35

Global minimum is at:

	dx	dy	dz	theta	phi	rogang	residual
485244	-0.0004	0.0004	-0.0012	0	0	0	0.000543



### 2.1.36 bank36

### 2.1.37 bank37

### 2.1.38 bank38

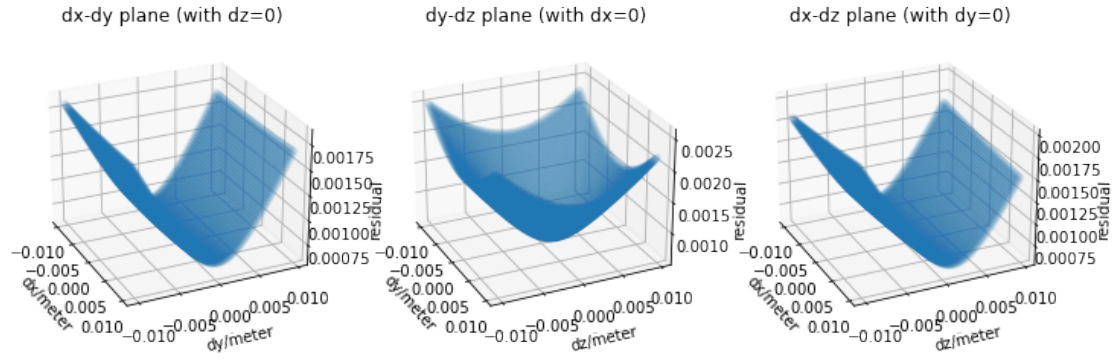
### 2.1.39 bank39

### 2.1.40 bank40

### 2.1.41 bank41

Global minimum is at:

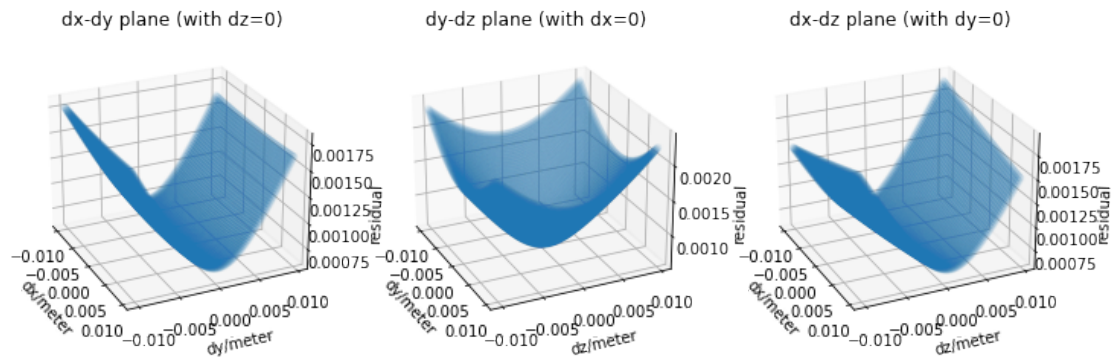
	dx	dy	dz	theta	phi	rogang	residual
445254	-0.0012	0.0004	0.0008	0	0	0	0.000627



## 2.1.42 bank42

Global minimum is at:

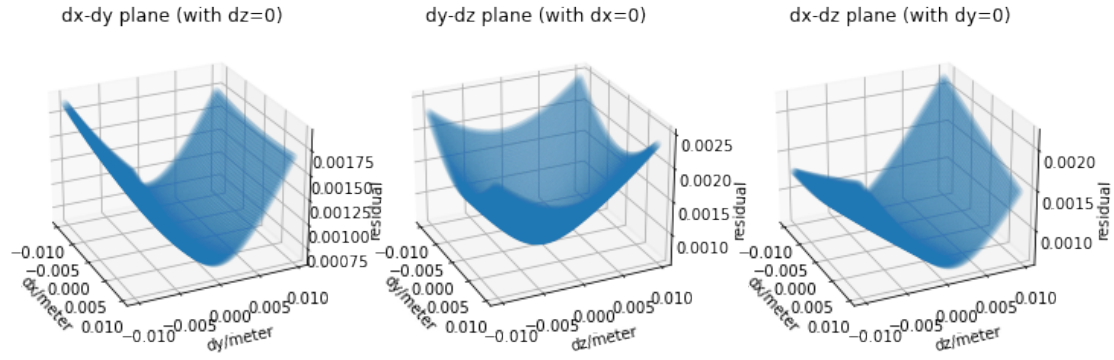
	dx	dy	dz	theta	phi	rogang	residual
385247	-0.0024	0.0004	-0.0006	0	0	0	0.000645



## 2.1.43 bank43

Global minimum is at:

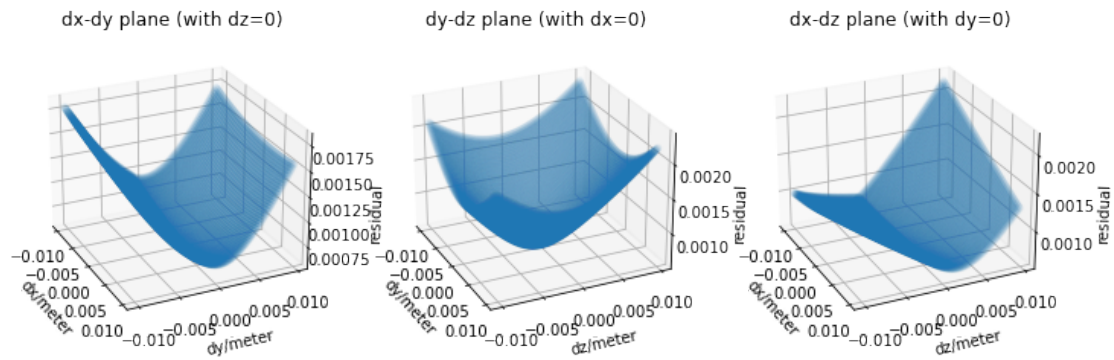
	dx	dy	dz	theta	phi	rogang	residual
375243	-0.0026	0.0004	-0.0014	0	0	0	0.000669



#### 2.1.44 bank44

Global minimum is at:

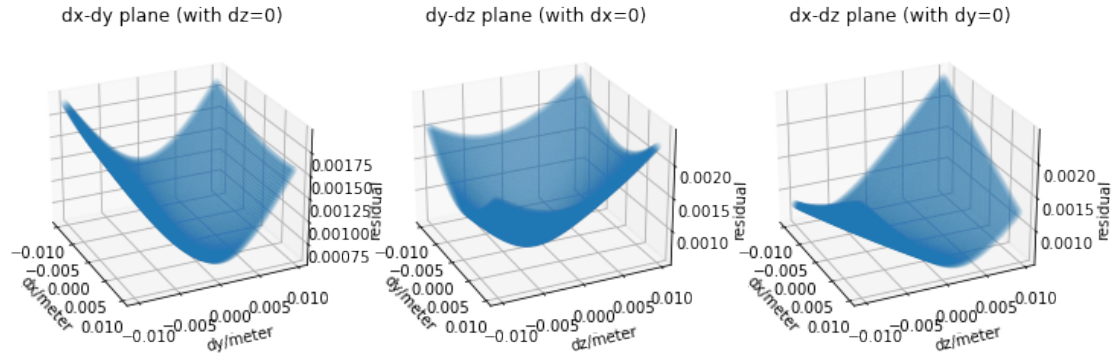
	dx	dy	dz	theta	phi	rogang	residual
455242	-0.001	0.0004	-0.0016	0	0	0	0.000616



#### 2.1.45 bank45

Global minimum is at:

	dx	dy	dz	theta	phi	rogang	residual
485239	-0.0004	0.0004	-0.0022	0	0	0	0.000607



2.1.46 bank46

2.1.47 bank47

2.1.48 bank48

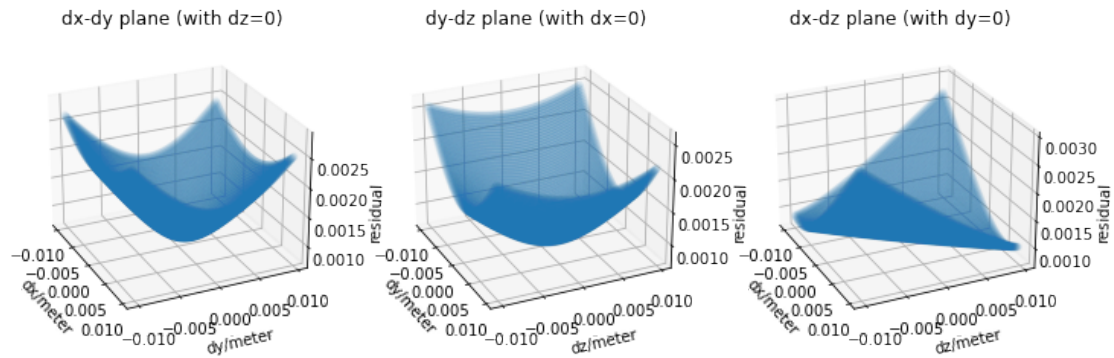
2.1.49 bank49

2.1.50 bank50

2.1.51 bank51

Global minimum is at:

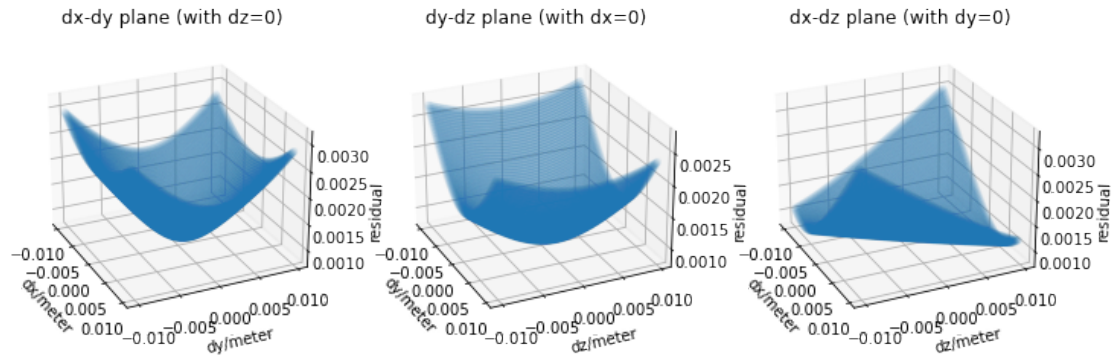
	dx	dy	dz	theta	phi	rogang	residual
525458	0.0004	0.0008	0.0016	0	0	0	0.000785



2.1.52 bank52

Global minimum is at:

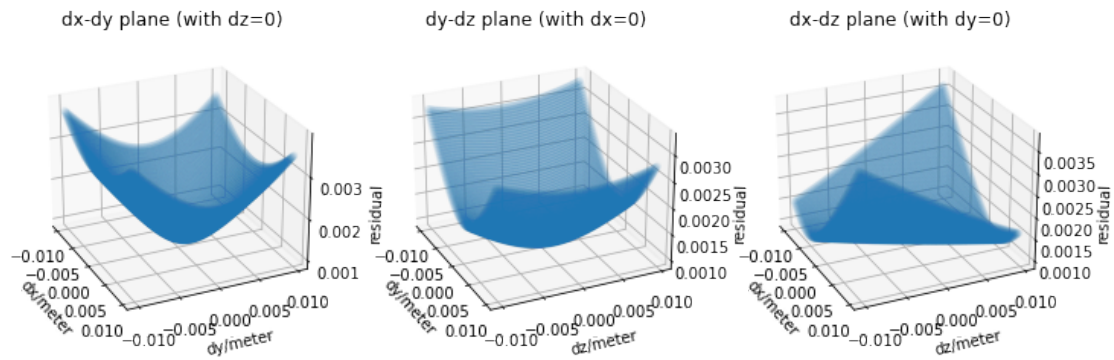
	dx	dy	dz	theta	phi	rogang	residual
565364	0.0012	0.0006	0.0028	0	0	0	0.000853



### 2.1.53 bank53

Global minimum is at:

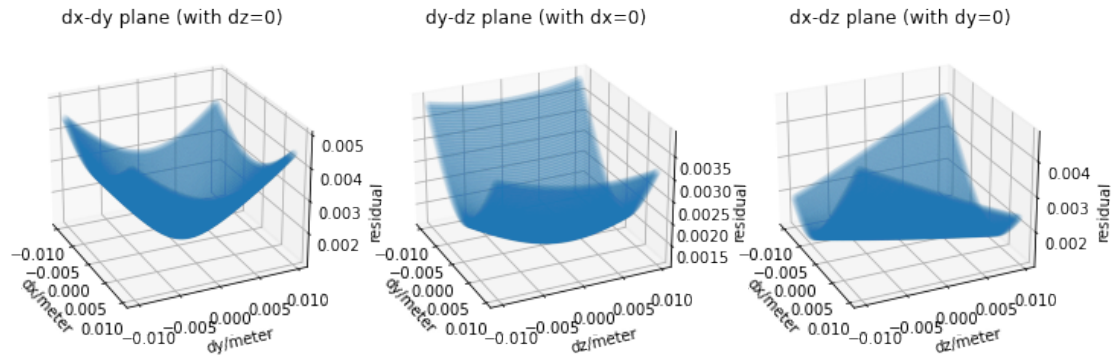
	dx	dy	dz	theta	phi	rogang	residual
475447	-0.0006	0.0008	-0.0006	0	0	0	0.001006



### 2.1.54 bank54

Global minimum is at:

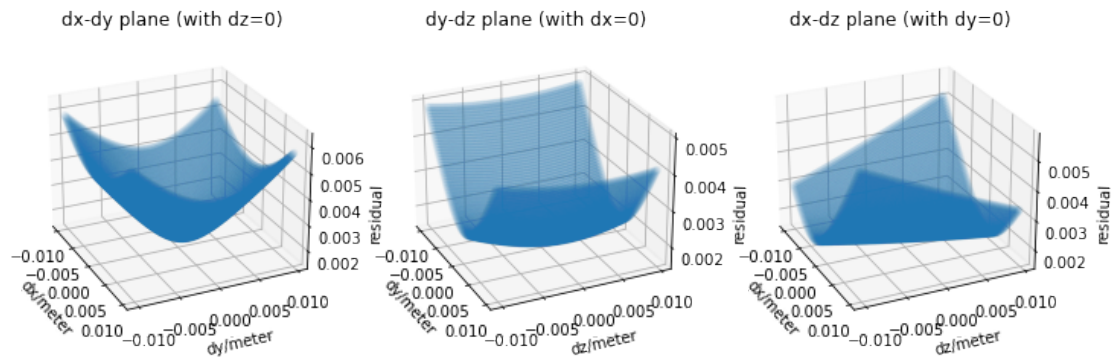
	dx	dy	dz	theta	phi	rogang	residual
475455	-0.0006	0.0008	0.001	0	0	0	0.001206



### 2.1.55 bank55

Global minimum is at:

	dx	dy	dz	theta	phi	rogang	residual
515464	0.0002	0.0008	0.0028	0	0	0	0.001633



### 2.1.56 bank56

### 2.1.57 bank57

### 2.1.58 bank58

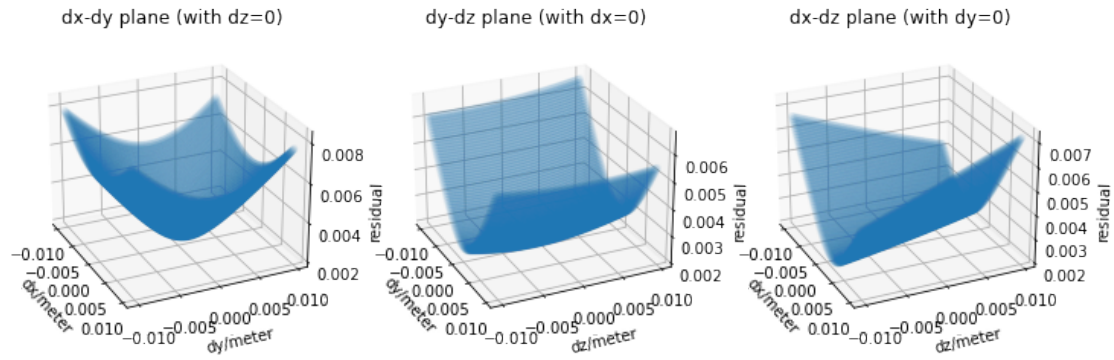
### 2.1.59 bank59

### 2.1.60 bank60

### 2.1.61 bank61

Global minimum is at:

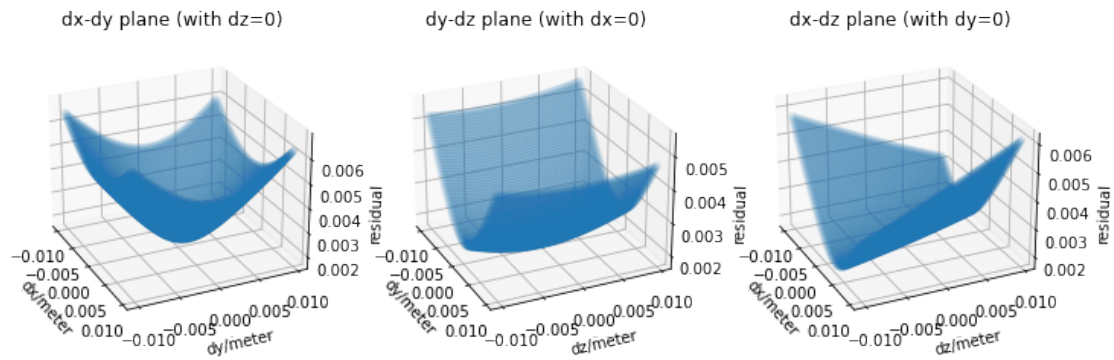
	dx	dy	dz	theta	phi	rogang	residual
515334	0.0002	0.0006	-0.0032	0	0	0	0.002172



## 2.1.62 bank62

Global minimum is at:

	dx	dy	dz	theta	phi	rogang	residual
475351	-0.0006	0.0006	0.0002	0	0	0	0.001866

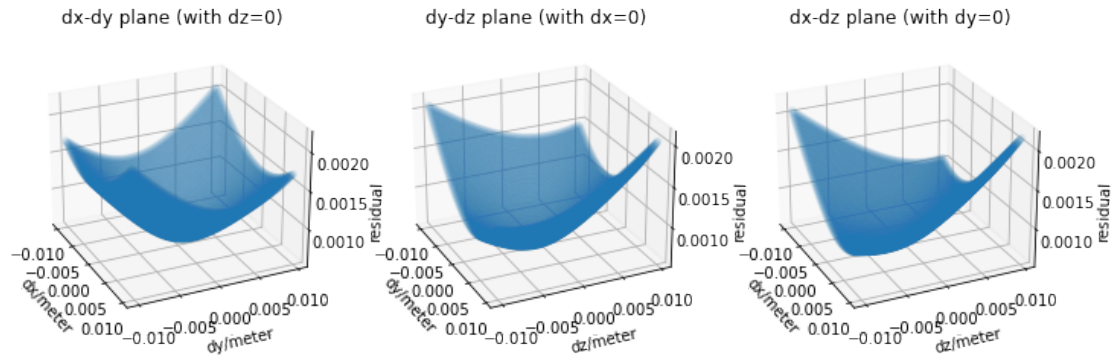


## 2.1.63 bank63

Global minimum is at:

	dx	dy	dz	theta	phi	rogang	residual
485149	-0.0004	0.0002	-0.0002	0	0	0	0.000615

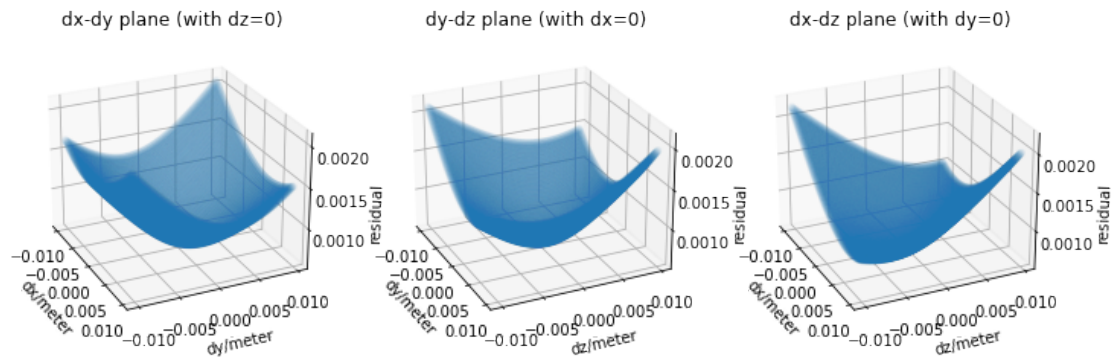




#### 2.1.64 bank64

Global minimum is at:

	dx	dy	dz	theta	phi	rogang	residual
525151	0.0004	0.0002	0.0002	0	0	0	0.000612

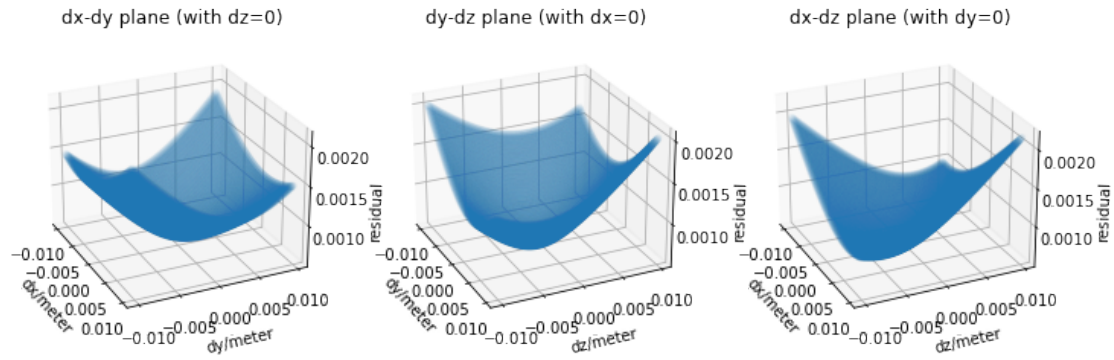


#### 2.1.65 bank65

Global minimum is at:

	dx	dy	dz	theta	phi	rogang	residual
485247	-0.0004	0.0004	-0.0006	0	0	0	0.000579





**2.1.66 bank66**

**2.1.67 bank67**

**2.1.68 bank68**

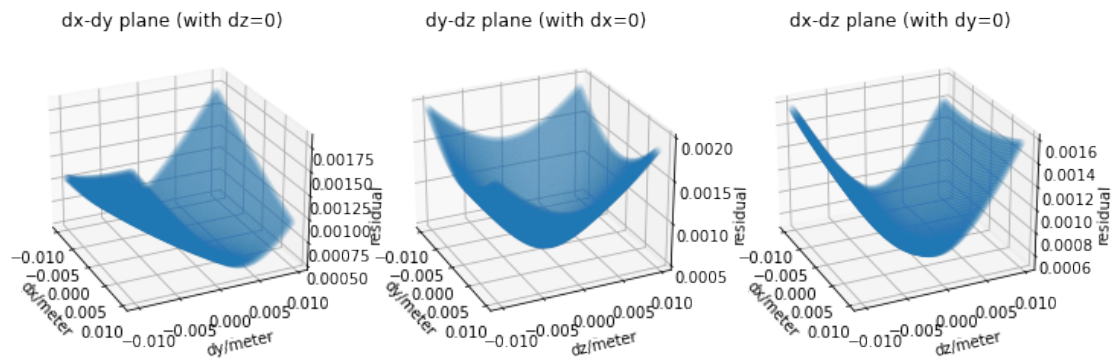
**2.1.69 bank69**

**2.1.70 bank70**

**2.1.71 bank71**

Global minimum is at:

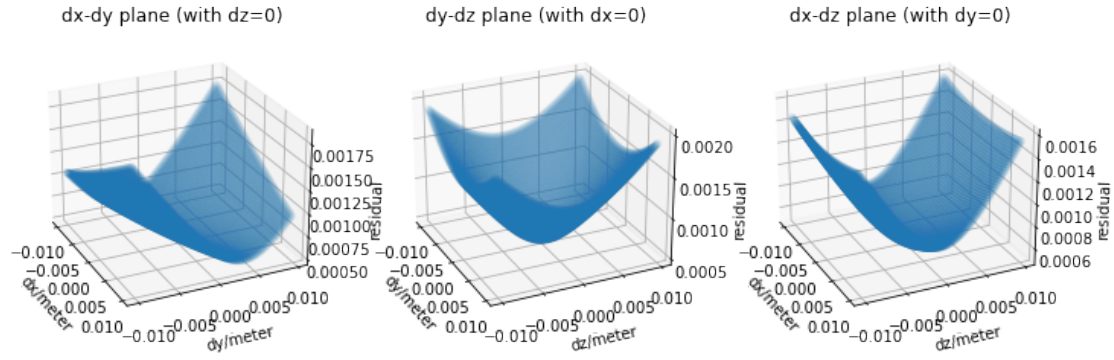
	dx	dy	dz	theta	phi	rogang	residual
505250	-4.878910e-19	0.0004	-4.878910e-19	0	0	0	0.000548



**2.1.72 bank72**

Global minimum is at:

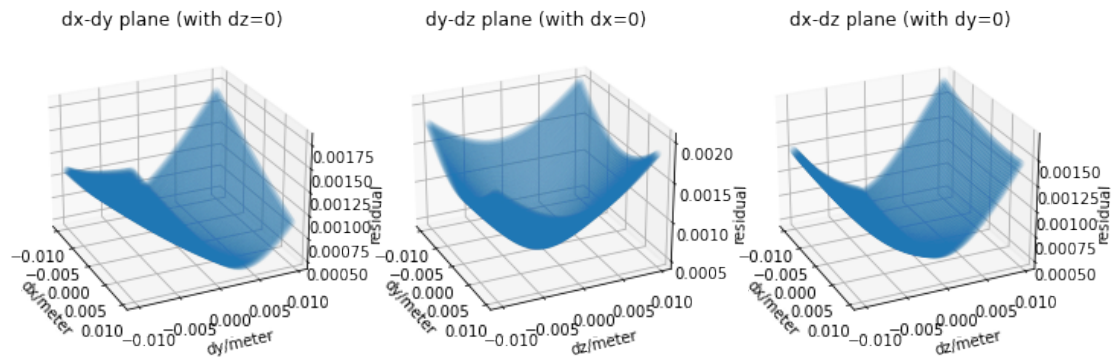
	dx	dy	dz	theta	phi	rogang	residual
515248	0.0002	0.0004	-0.0004	0	0	0	0.000534



### 2.1.73 bank73

Global minimum is at:

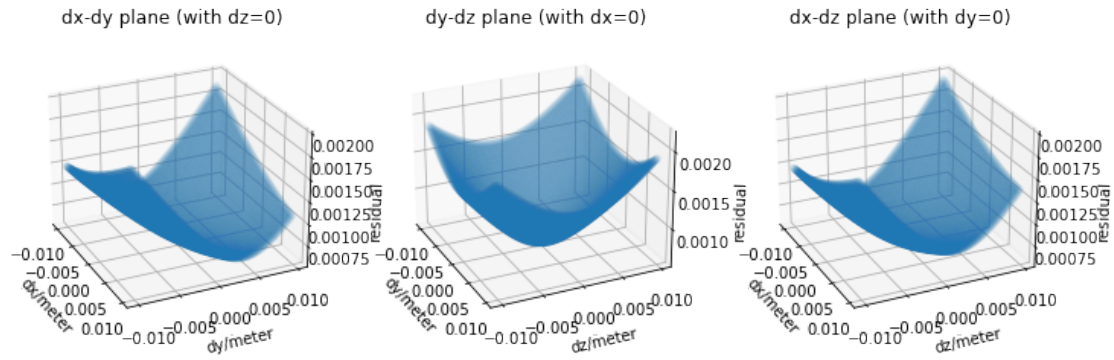
	dx	dy	dz	theta	phi	rogang	residual
605647	0.002	0.0012	-0.0006	0	0	0	0.000508



### 2.1.74 bank74

Global minimum is at:

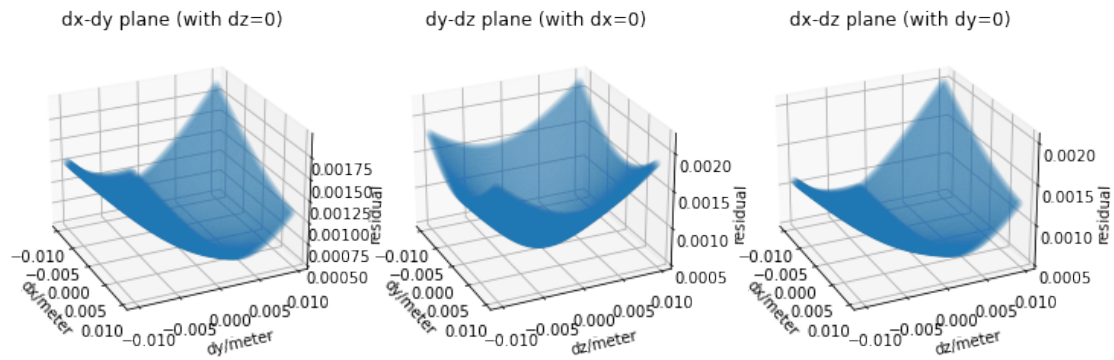
	dx	dy	dz	theta	phi	rogang	residual
535348	0.0006	0.0006	-0.0004	0	0	0	0.000616



### 2.1.75 bank75

Global minimum is at:

	dx	dy	dz	theta	phi	rogang	residual
575449	0.0014	0.0008	-0.0002	0	0	0	0.000558



### 2.1.76 bank76

### 2.1.77 bank77

### 2.1.78 bank78

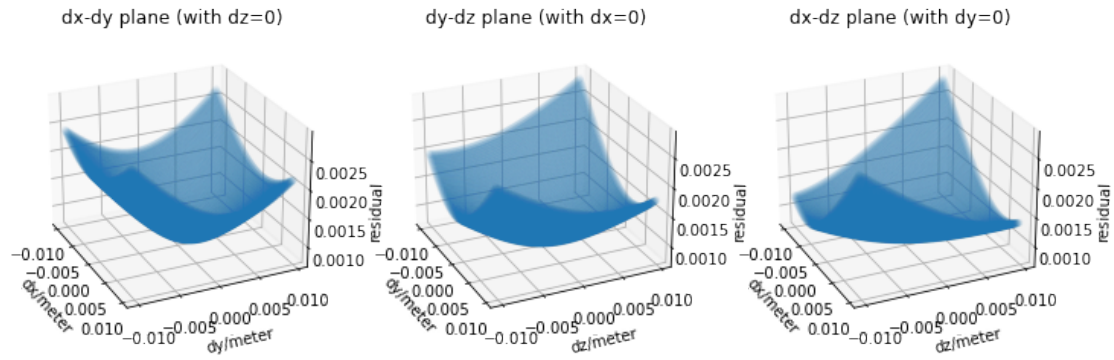
### 2.1.79 bank79

### 2.1.80 bank80

### 2.1.81 bank81

Global minimum is at:

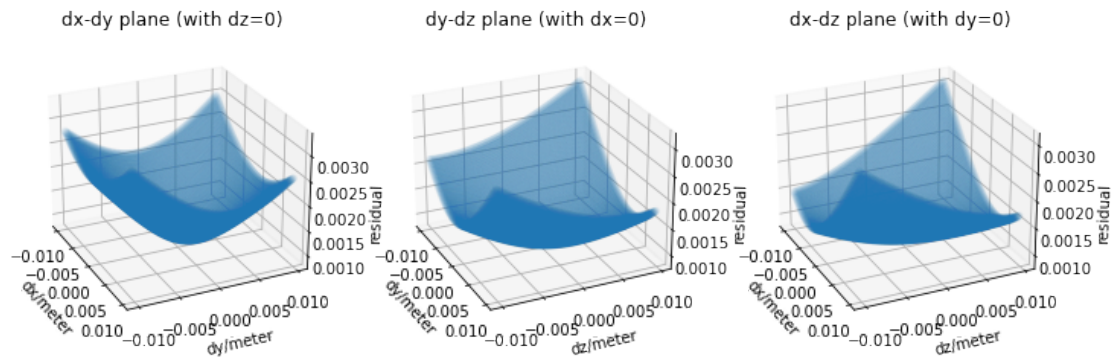
	dx	dy	dz	theta	phi	rogang	residual
424937	-0.0016	-0.0002	-0.0026	0	0	0	0.000806



### 2.1.82 bank82

Global minimum is at:

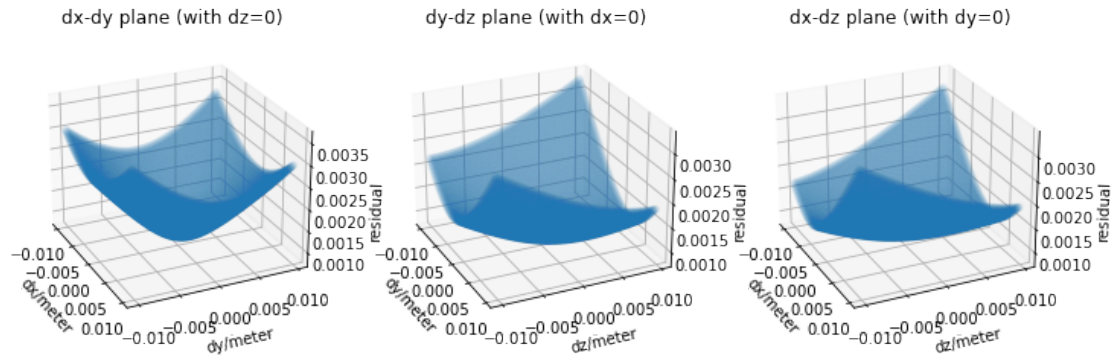
	dx	dy	dz	theta	phi	rogang	residual
495449	-0.0002	0.0008	-0.0002	0	0	0	0.000911



### 2.1.83 bank83

Global minimum is at:

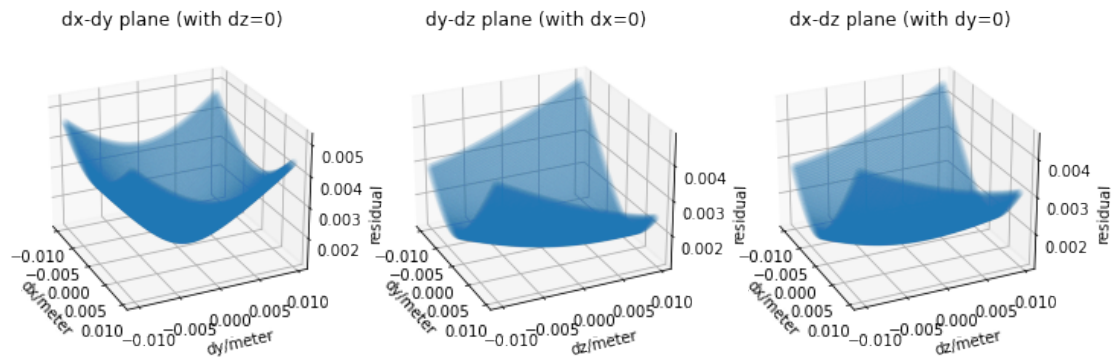
	dx	dy	dz	theta	phi	rogang	residual
465147	-0.0008	0.0002	-0.0006	0	0	0	0.000881



#### 2.1.84 bank84

Global minimum is at:

	dx	dy	dz	theta	phi	rogang	residual
505555	-4.878910e-19	0.001	0.001	0	0	0	0.001277

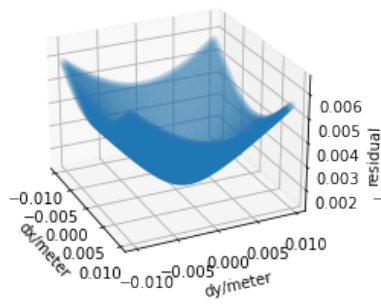


#### 2.1.85 bank85

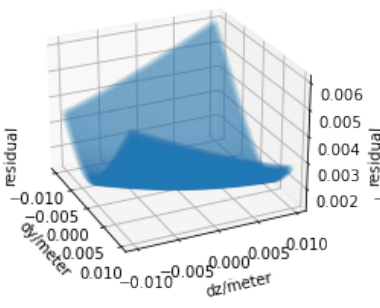
Global minimum is at:

	dx	dy	dz	theta	phi	rogang	residual
515962	0.0002	0.0018	0.0024	0	0	0	0.001476

dx-dy plane (with dz=0)



dy-dz plane (with dx=0)



dx-dz plane (with dy=0)

