



Supplement of

KarstConduitCatalogue: a dataset of LiDAR derived point clouds for the analysis of karstic conduit geometry and morphology

Tanguy Racine et al.

Correspondence to: Tanguy Racine (tanguy.racine@unine.ch)

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Section S1: Point sets

Table S1. List of point sets

cave	passage	scanner	centreline length	spatial sampling	point count	file size	RMS*
Archamps	Post-crawl	BLK2GO	51.6 m	2 mm	1.3605×10^8	7.7 Go	9 cm
				5 cm	2.2×10^5	12 Mo	
	Pre-crawl	BLK2GO	172.0 m	2 mm	3.9897×10^8	22 Go	11 cm
				5 cm	8.2×10^5	46 Mo	
Baume de Longeaigne	Great Toboggan	BLK2GO	58.0 m	2 mm	1.4074×10^8	9.3 Go	2 cm
				5 cm	3.7×10^5	25 Mo	
Grotte de la Cascade (Môtiers)	Main Gallery	BLK2GO	523.9 m	2 mm	9.4565×10^8	62 Go	5 cm
				5 cm	3.59×10^6	240 Mo	
Cocalière - Cotepatière	Main Gallery 1	BLK2GO	241.8 m	2 mm	2.8424×10^8	16 Go	
				5 cm	1.79×10^6	101 Mo	
	Main Gallery 2	BLK2GO	207.7 m	2 mm	3.5975×10^8	20 Go	
				5 cm	1.87×10^6	105 Mo	
	Main Gallery 3	BLK2GO	373.9 m	2 mm	4.9665×10^8	28 Go	
				5 cm	2.92×10^6	165 Mo	
	Event de Cotepatière	BLK2GO	367.7 m	2 mm	5.0877×10^8	29 Go	
				5 cm	3.44×10^6	194 Mo	
Gouffre des Encanaux	Post-siphon	BLK2GO	238.3 m	2 mm	4.2609×10^8	24 Go	14 cm
				5 cm	1.79×10^6	101 Mo	
	Pre-siphon	BLK2GO	378.4 m	2 mm	8.6379×10^8	49 Go	22 cm
				5 cm	2.40×10^6	136 Mo	
Event de Peyrejal	Downstream Gallery	BLK2GO	331.7 m	2 mm	5.9192×10^8	34 Go	
				5 cm	2.13×10^6	120 Mo	
Grotte des Faux Monnayeurs	Entrance Gallery	BLK2GO	324.0 m	2 mm	6.6995×10^8	37 Go	22 cm
				5 cm	2.95×10^6	167 Mo	
Grotte de la Madeleine	Filleul passage	FARO Focus	112.9 m	2 mm	1.591×10^7	1.1 Go	
				5 cm	6.5×10^5	39 Mo	
Grotte de la Sourde	Entrance Gallery	BLK2GO	42.5 m	2 mm	1.1982×10^7	6.7 Go	7 cm
				5 cm	3.7×10^5	25 Mo	
Hölloch	Keller-Aquarium	BLK2GO	134.7 m	2 mm	2.2698×10^8	13 Go	
				5 cm	8.5×10^5	48 Mo	
	Riesengang	BLK2GO	613.7 m	2 mm	9.5621×10^8	54 Go	
				5 cm	3.93×10^6	222 Mo	
	Seengang	BLK2GO	323.9 m	2 mm	6.6146×10^8	37 Go	
				5 cm	2.71×10^6	154 Mo	
Lauiloch	Main Gallery	BLK2GO	252.7 m	2 mm	5.8510×10^8	38 Go	17 cm
				5 cm	1.23×10^6	81 Mo	

cave	passage	scanner	centreline length	spatial sampling	point count	file size	RMS*
Les Cavottes	North gallery	BLK2GO	501.9 m	2 mm	6.0099×10^8	38 Go	17 cm
				5 cm	3.95×10^6	81 Mo	
Markov Spodmol	Main Gallery	BLK2GO	500.8 m	2 mm	1.14253×10^9	65 Go	31 cm
				5 cm	5.55×10^6	314 Mo	
Rupt du Puits	Cascades	Faro Focus	46.2 m	2 mm	1.305×10^7	866 Mo	
				5 cm	3.8×10^5	25 Mo	
Grotte de Vallorbe	semi-active Gallery	BLK2GO	171.4 m	2 mm	4.4575×10^8	25 Go	11 cm
				5 cm	1.93×10^6	109 Mo	
Vers Chez Le Brandt	Main Gallery	BLK2GO	210.2 m	2 mm	2.829×10^8	19 Go	22 cm
				5 cm	2.54×10^6	169 Mo	

* wherever applicable, this refers to the physical pairwise registration root mean square error.

Section S2: Metadata file templates

2.1 Cave description

```
---
580 documentTitle : "Cave LiDAR Scan description"
    documentAuthor: <TheDocumentAuthor>"
    dateCreated: <YYY.MM.DD>

cave:
585     caveName: "<TheCaveNameInCamelCase>"
        fullCaveName: "<The full cave name>"
        country: "<theCountry>"
        region: "<theRegion>"
        locality: "<theTownOrDistric>"
590     entrance:
        latitude:
            value: <theLatitude>
            format: "decimal degrees"
        longitude:
595             value: <theLongitude>
            format: "decimal degrees"
        elevation:
            value: <theCaveEntranceElevation>
            format: "metres"
600     datum: "<theDatum>"
        comment: "AnyDetailedSpecification"
    geology:
        lithology: "<theLithology>"
        tectonics: "<theTectonicContext>"
605     structural: "<anyStructuralMeasurementsOrInformation>"
    hydrology: "<theCaveHydrology>"
    speleogenesis: "<anyKnownSpeleogeneticinformation>"
```

2.2 Scan description

```
---
610 documentTitle : "Cave LiDAR Scan description"
    documentAuthor: <TheDocumentAuthor>"
    dateCreated: <YYY.MM.DD>

#... Scanning procedure
615 scan:
    scanName: <theScan>
    scannerTypeAndMake: "<theScanner>"
    processingSoftware: "<theSoftwareUsedForSceneCoRegistration>"
    lighting: "<theLighting>"
620    scanOperators: ["<Operator 1>", "<Operator 2>, ..."]
    scanDate: <YYYY.MM.DD>
    remarks: "<AnyFinalRemarks>"
    links: "<AnyLinks>"
```

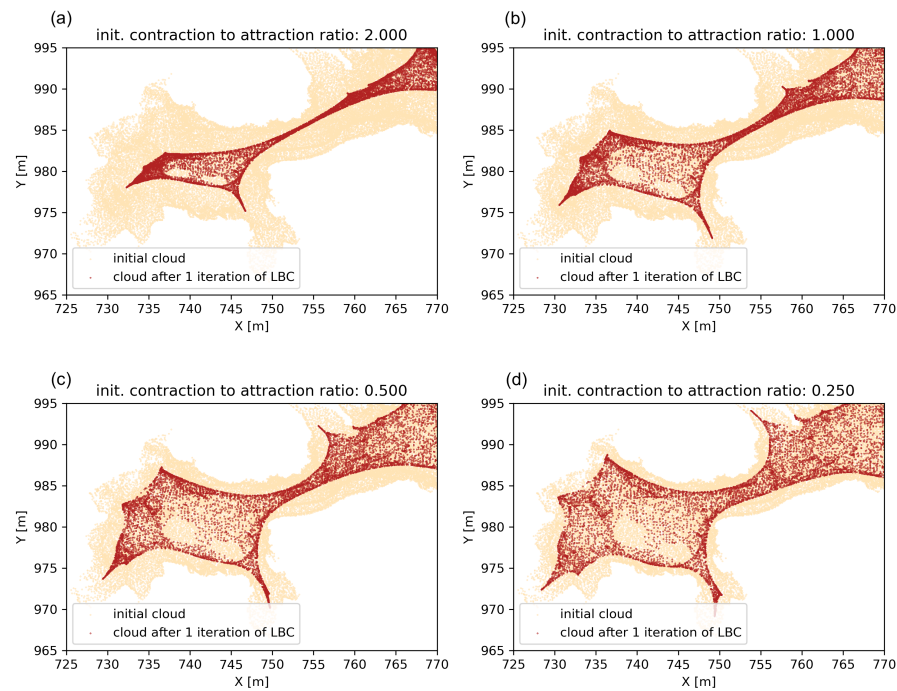


Figure S1. Impact of ratio between contraction and attraction weights at first iteration of the Laplacian-based contraction. (a-d) the panels display top-down projections of the original point clouds together with the contracted clouds.

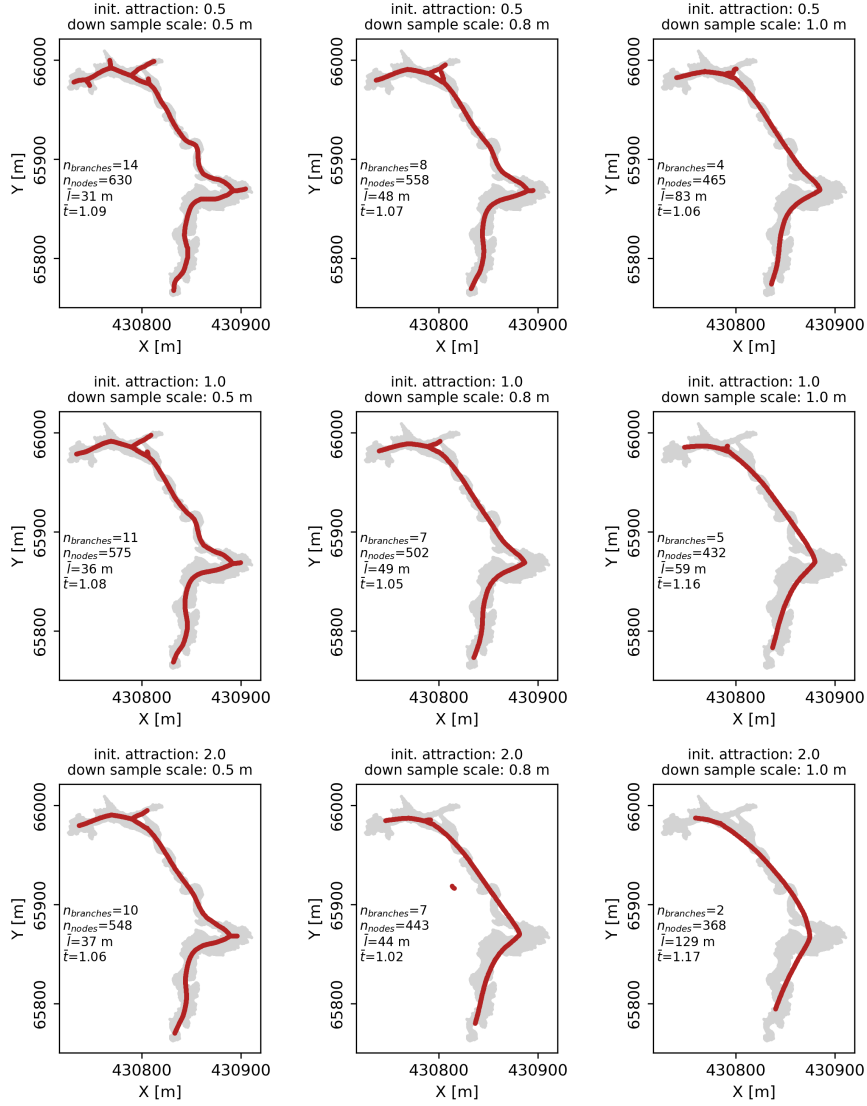


Figure S2. Impact of initial contraction weights and down sampling distance as parameter choices in the point cloud contraction algorithm. Initial attraction weights are fixed at 0.5. The panels display top-down projections of the original point clouds together with the calculated centreline.