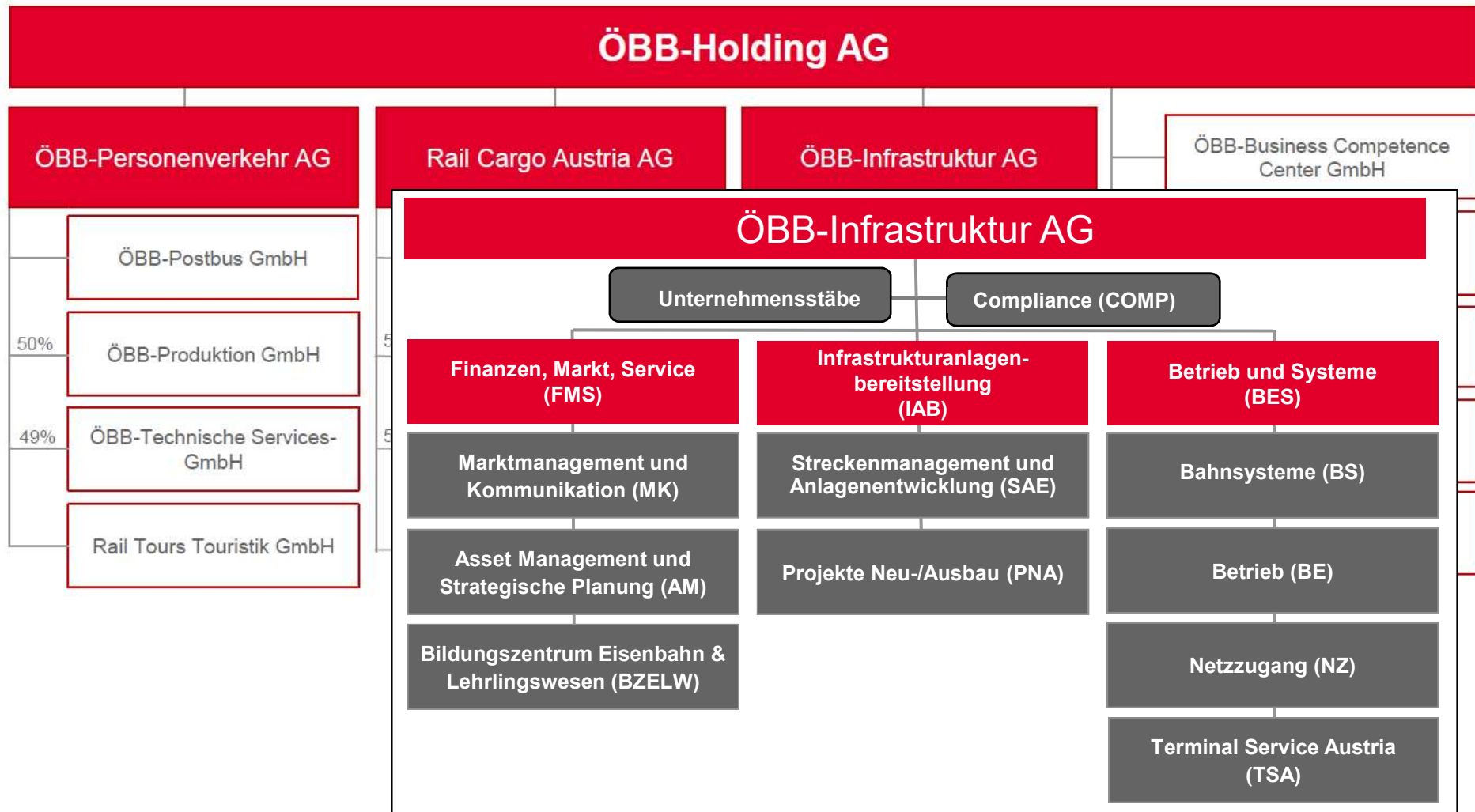


# FME World Tour 2019

## **FME als Werkzeug zur (Re)Konstruktion von Gleisgeometrien**

**DI Thomas Tengler, ÖBB-Infrastruktur**

Triggercheck



# Trassierung



SQL Worksheet | History

gleistraster@EGIS

Worksheet Query Builder

```

select
  BD.GLBD_GGBE_ID, BD.GLBD_SORTNR, BD.GLBD_GLBS_ID, BD.GLBD_GLBS_ID2,
  BD.GLBD_RI_GGEL_ID as IGL_ELID, BD.GLBD_STATION_AX as IGL_STATION, BD.GLBD_RI_ELEM_ART as IGL_ART, BD.GLBD_RI_LAENGE_AX as IGL_LAENGE,
  BD.GLBD_RI_RADIUS_AX as IGL_RADIUS, BD.GLBD_KRUEMMUNG_AX2 as IGL_KRA, BD.GLBD_KRUEMMUNG_AX_BIS as IGL_KRE, BD.GLBD_QN_UEBERHOEHUNG as IGL_QNA,
  BD.GLBD_QN_UEBERHOEHUNG_BIS as IGL_QNE, AB.GGAB_A as IGL_A, AB.GGAB_PHI_T as IGL_RICHT, AB.GGAB_XH as IGL_HW, AB.GGAB_YH as IGL_RW,
  FG.FGLE_CODE as IGL_GLCODE
from GR_PROD.GG_GLEISBAND@DB_PPROD BD, GR_PROD.GG_AXIS_BVZ@DB_PPROD AB,
  GR_PROD.FGLE_OBJ_ZUORD@DB_PPROD OZ, GR_PROD.FACHGLEISE@DB_PPROD FG
where BD.GLBD_GGBE_ID = 125632264
  and OZ.FGOZ_OBJ_ID = BD.GLBD_GGBE_ID
  and OZ.FGOZ_FGLE_ID = FG.FGLE_ID
  and AB.GGAB_GGEL_ID(+) = BD.GLBD_RI_GGEL_ID
  and BD.GLBD_RI_GGEL_ID is not NULL
order by BD.GLBD_GGBE_ID, BD.GLBD_SORTNR asc;
    
```

Query Result x

SQL | Fetched 50 rows in 0.108 seconds

	GLBD_GGBE_ID	GLBD_SORTNR	GLBD_GLBS_ID	GLBD_GLBS_ID2	IGL_ELID	IGL_STATION	IGL_ART	IGL_LAENGE	IGL_RADIUS	IGL_KRA	IGL_KRE	IGL_QNA	IGL_QNE	IGL_A	IGL_RICHT	IGL_HW	IGL_RW	IGL_GLCODE
11	125632264	106	104949037	(null)	1374637184	49271,8567 G		40,3147	(null)	0	0	0	0	247,06177	295977,454799	-7841,65103	2055/G1.1	
12	125632264	109	104949038	(null)	1374637264	49326,7979 K		97	(null)	0	0,0005	0	65	440,454	247,06177	295977,454799	-7868,812261	2055/G1.1
13	125632264	111	104949038	(null)	1374637269	49423,7979 B		242,0183	2000	0,0005	0,0005	65	65	0	248,60558	295876,514739	-7934,739611	2055/G1.1
14	125632264	118	104949038	(null)	1374637274	49665,8162 K		97,8507	(null)	0,0005	0	65	0	442,382	256,30926	295712,213987	-8112,240824	2055/G1.1
15	125632264	120	104949038	(null)	1374637279	49763,6669 G		1372,3548	(null)	0	0	0	0	257,8666	295651,452892	-8188,937275	2055/G1.1	
16	125632264	158	104949038	(null)	1374638108	51136,0217 B		20,0398	-151000	-0,000...	-0,00000...	0	0	0	257,8666	294808,056602	-9271,545366	2055/G1.1
17	125632264	160	104949038	(null)	1374637289	51156,0615 G		327,0307	(null)	0	0	0	0	257,85815	294795,739858	-9287,353334	2055/G1.1	
18	125632264	181	104949038	(null)	1374637294	51483,0922 B		62,4132	-90000	-0,000...	-0,00001...	0	0	0	257,85815	294594,725197	-9545,310997	2055/G1.1
19	125632264	186	104949038	(null)	1374637299	51545,5054 G		98,1146	(null)	0	0	0	0	257,814	294495,98373	-9594,528497	2055/G1.1	
20	125632264	195	104949038	(null)	1473973429	51643,62 K		86,401	(null)	0	0,000222...	0	0	623,54	257,814	294495,98373	-9671,877833	2055/G1.1
21	125632264	197	104949038	(null)	1473973434	51730,021 B		29,094	4500	0,0002...	0,000222...	0	0	0	258,4252	294443,047492	-9740,162064	2055/G1.1
22	125632264	199	104949038	(null)	1473973439	51759,115 K		110,356	(null)	0,0002...	0	0	0	704,702	258,8367	294425,444314	-9763,326405	2055/G1.1
23	125632264	202	104949038	(null)	1473973444	51869,471 G		3886,2506	(null)	0	0	0	0	259,6174	294359,680492	-9851,946764	2055/G1.1	
24	125632264	291	104949039	(null)	125632287	55755,42 B		154,996...	-28823,...	-0,000...	-0,00003...	0	0	(null)	(null)	(null)	(null)	2055/G1.1
25	125632264	298	104949039	(null)	125632291	55910,416... B		134,996...	27596,1...	0,0000...	0,000036...	0	0	(null)	(null)	(null)	(null)	2055/G1.1
26	125632264	302	104949039	(null)	125632295	56045,412... G		1381,27	(null)	0	0	0	0	(null)	(null)	(null)	(null)	2055/G1.1
27	125632264	367	104949040	(null)	125632299	57420 B		134,995...	23907,8...	0,0000...	0,000041...	0	0	(null)	(null)	(null)	(null)	2055/G1.1
28	125632264	375	104949040	(null)	125632303	57554,995... B		134,995...	-23695,...	-0,000...	-0,00004...	0	0	(null)	(null)	(null)	(null)	2055/G1.1
29	125632264	378	104949040	(null)	125632307	57689,991... G		4053,5384	(null)	0	0	0	0	(null)	(null)	(null)	(null)	2055/G1.1
30	125632264	485	104949041	(null)	597322942	61739,7854 K		80	(null)	0	0,0004	0	25	447,214	259,6325	288507,222	-17807,649	2055/G1.1
31	125632264	489	104949041	(null)	597322947	61819,7854 B		492,6397	2500	0,0004	0,0004	25	25	0	260,6511	288460,171	-17872,349	2055/G1.1
32	125632264	502	104949041	(null)	597322952	62312,4251 K		40	(null)	0,0004	0,000322...	25	0	718,795	273,1961	288215,971	-18299,286	2055/G1.1

iGleis Output Info
- □ ×

← → ↻ 🏠
🔍 Suchen

**iGleisgeometrie Darstellung**

WebGIS → FireFoxonly

**Suchen / registrieren aus iGleis**

Gleis-Code: 
Suche

R	.....	GIBereich	.....	-iGIDatum-	iGIDatum	.....	Strecke	.....	.....
a	4015/Gl.1	.....	--29.04.19	Bestand	.....	(200-54141,63)	.....	---	SALZBURG HBF. (A) - BISCHOFSHOFEN (E)
a	4015/Gl.1	.....	--21.10.14	Projekt	.....	(41670,683-44938,639)	.....	---	SALZBURG HBF. (A) - BISCHOFSHOFEN (E)
a	4015/Gl.1	.....	--03.10.18	Projekt	.....	(1484-5103,226)	.....	---	SALZBURG HBF. (A) - BISCHOFSHOFEN (E)
a	4015/Gl.1	.....	--01.02.14	Projekt	.....	(768,932-1342,225)	.....	---	SALZBURG HBF. (A) - BISCHOFSHOFEN (E)
a	4015/Gl.1	.....	--16.02.18	Projekt	.....	(32484,079-33347,145)	.....	---	SALZBURG HBF. (A) - BISCHOFSHOFEN (E)
a	4015/Gl.1	.....	--12.04.17	Projekt	.....	(19859,198-21464,072)	.....	---	SALZBURG HBF. (A) - BISCHOFSHOFEN (E)
a	4015/Gl.1	.....	--08.02.19	Projektfreigabe	.....	(17156,813-17776,306)	.....	---	SALZBURG HBF. (A) - BISCHOFSHOFEN (E)
a	4015/Gl.1	.....	--04.10.17	Projektfreigabe	.....	(21915,796-25807,308)	.....	---	SALZBURG HBF. (A) - BISCHOFSHOFEN (E)
c	4015/Gl.1AB/GG	.....	--15.09.14	Bestand	.....	(31521,59-31660)	.....	---	Golling - AB TAGGER

registriere import auf TMP

a 2302/Gl.7	.....	->E--SZM-<-	K--20180216	Bestand	.....	(789,865-8320,204)	.....	---	ABZW.WIEN MEIDLING (A) - KNOTEN AUHOF (A) (NEUE WESTBAHN)
a 2302/Gl.9	.....	->E--SZM-<-	K--20180216	Bestand	.....	(818,135-8353,602)	.....	---	ABZW.WIEN MEIDLING (A) - KNOTEN AUHOF (A) (NEUE WESTBAHN)
a 2303/Gl.7	.....	->EP-SZM-<-	K--20180222	Bestand	.....	(8320,741-28245,758)	.....	---	KNOTEN AUHOF (E) - TULLNERFELD (A) (NEUE WESTBAHN)
a 2303/Gl.9	.....	->EP-SZM-<-	K--20180226	Bestand	.....	(8353,602-28242,095)	.....	---	KNOTEN AUHOF (E) - TULLNERFELD (A) (NEUE WESTBAHN)
a 2304/Gl.3HL	.....	->EP-SZM-<-	K--20180215	Bestand	.....	(54492,709-57100)	.....	---	TULLNERFELD (E) - KNOTEN WAGRAM (E) (NEUE WESTBAHN)
a 2304/Gl.4HL	.....	->EP-SZM-<-	K--20180313	Bestand	.....	(54480-57009,021)	.....	---	TULLNERFELD (E) - KNOTEN WAGRAM (E) (NEUE WESTBAHN)
a 2304/Gl.7	.....	->EP-SZM-<-	K--20180215	Bestand	.....	(28247,947-54421,928)	.....	---	TULLNERFELD (E) - KNOTEN WAGRAM (E) (NEUE WESTBAHN)
a 2304/Gl.9	.....	->EP-SZM-<-	K--20180226	Bestand	.....	(28241,097-54407,7798)	.....	---	TULLNERFELD (E) - KNOTEN WAGRAM (E) (NEUE WESTBAHN)
a 2305/Gl.3	.....	->EPKSZM-<-	K--20180315	Bestand	.....	(56896,425-73733)	.....	---	Gl.3 KNOTEN WAGRAM (A) - KNOTEN ROHR (A)
a 2305/Gl.4	.....	->EPKSZM-<-	K--20180315	Bestand	.....	(56894,423-73523,46)	.....	---	Gl.4 KNOTEN WAGRAM (A) - KNOTEN ROHR (A)

WGIS-Bereich

KoordSysDef

P-L-KorrDef

TMP import

Import

Imp+FktKorr

Knoten/Station

GLRaster

LineKorrektur

CheckBES

CheckKorr

CheckUpdte

Regist. löschen

Kopie löschen

Knoten+ löschen

Raster löschen

**FME-Server**  
 ...  
**Download aus iGleis-GIS-Bestand**  
 Temp.....--> temporär importierter Abschnitt Shapeformat ▼ MLA ▼  

Download

iGleis KoordinatensystemDefinition x | gis infragis - Projekt Gleisraster x | +

ws09315.buero.oebb.at/gleisraster2/igl\_koordsysdef.php?i\_c=125632264

Suchen

**iGleisgeometrie WEB**

iGleisgeometrie Koordinatensystem

**Koordinatensystem Zuordnung 2055/GI.1 (BereichsID 125632264)**

Strecke GI.1 WR.NEUSTADT (E) - GLOGGNITZ (A)

TeilBereich	RW von	bis	HW von	bis	Stat-Bereich	Anzahl
alt	1240926	-> -7687 bis -7440	296147	bis 296645	> 48478-49043	< c.7 - M34
neu	104949037	-> -7842 bis -7440	295977	bis 296645	> 48478-49272	< c.10
alt	104754245	-> -7821 bis -7755	296000	bis 296072	> 49144-49241	< c.3 - M34
neu	104949038	-> -9852 bis -7869	294360	bis 295948	> 49327-51869	< c.12
alt	1240927	-> 0 bis 0	0	bis 0	> 49330-49762	< c.4 - M34
alt	1240928	-> 0 bis 0	0	bis 0	> 51650-51856	< c.4 - M34
alt	104796845	-> 0 bis 0	0	bis 0	> 52160-57373	< c.3 - M34
neu	104949039	-> bis	bis	bis	> 55755-56045	< c.3
alt	1240929	-> 0 bis 0	0	bis 0	> 57420-57690	< c.3 - M34
neu	104949040	-> bis	bis	bis	> 57420-57690	< c.3
alt	1240930	-> -18336 bis -17808	288200	bis 288507	> 61740-62352	< c.4 - M34
neu	104949041	-> -22060 bis -17808	286496	bis 288507	> 61740-66583	< c.19
alt	1132584	-> -21429 bis -19281	287102	bis 287960	> 63332-65709	< c.11 - M34
alt	1346188	-> -22791 bis -22100	285795	bis 286458	> 66639-67597	< c.4 - M34
neu	104949042	-> -22791 bis -22100	285795	bis 286458	> 66639-67597	< c.4
alt	1240935	-> 0 bis 0	0	bis 0	> 69161-70285	< c.19 - M34
neu	104949044	-> bis	bis	bis	> 69161-70285	< c.19
alt	1240936	-> 0 bis 0	0	bis 0	> 73173-74157	< c.9 - M34
neu	104949045	-> bis	bis	bis	> 73173-74157	< c.9

KoordDefinition

-keines-

M28

M28UI

M31

M34

LV03

schreiben

-

Eintrag löschen

'alt' löschen

zurück

The screenshot displays a web browser window with the following elements:

- Browser Tabs:** "iGleis KorrekturDefinition" and "gis infragis - Projekt Gleisraster".
- Address Bar:** "ws09315.buero.oebb.at/gleisraster2/igl\_korrddef.php?i\_c=125632264\_2055/GI.1".
- Map:** Shows a railway track segment with a color gradient from blue to green. A specific track element is labeled "40'12(GI.1 (125837759))".
- iGIEleKorr Dialog Box:** A configuration window with the following fields:
  - ELEMENTE: "ELEMENTE" (dropdown)
  - sK\_ART: "Kadd" (dropdown)
  - sK\_RW (optional): "-1000" (text input)
  - sK\_HW (optional): "0" (text input)
  - sK\_KSYS (optional): "M31" (dropdown)
  - sTOPOPKT (optional): (empty text input)
- Callout Box:** A box with arrows pointing to the dialog and map, containing the following text:
  - Koordinaten Addition
  - Multiplikation
  - Zwangspunkt Anfang
  - Ende
  - Koordinatensystemänderung
  - Elementlöschung
  - Richtungsvorgabe ‚durch Punkt‘

**iGleisgeometrie WEE**

WebGIS -->FireFoxonly

.. G1Bereich ...-. Stand -.LK
a 1036/G1.1.....->EP-----<
a 2055/G1.1.....->EPKSZM-<
a 2056/G1.1.....->EP-SZM-<
a 2056/G1.2.....->EP-SZM-<
a 2057/G1.1.....->EP-SZM-<
a 2057/G1.2.....->EP-SZM-<
a 2143/G1.1.....->EP-----<
a 2144/G1.1.....->E-----<
a 2144/G1.1.....->-----<
a 2302/G1.7.....->E--SZM-<
a 2302/G1.9.....->E--SZM-<
a 2303/G1.7.....->EP-SZM-<
a 2303/G1.9.....->EP-SZM-<
a 2304/G1.3HL.....->EP-SZM-<
a 2304/G1.4HL.....->EP-SZM-<
a 2304/G1.7.....->EP-SZM-<
a 2304/G1.9.....->EP-SZM-<
a 2305/G1.3.....->EPKSZM-<
a 2305/G1.4.....->EPKSZM-<

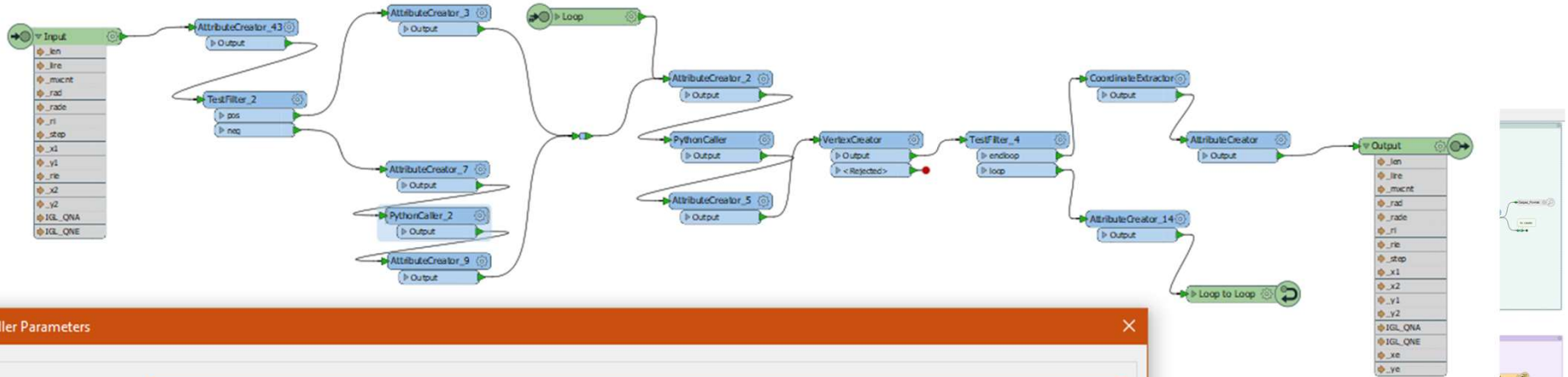
WGIS-Bereich

Temp...

```
function fme_init() {
    FMEServer.init({
        server : "http://fme-stage.oebb.at:8080",
        token : "4da30f752053c57a4a06db8592347572a6640c41" // 2019-03-06 15:16:18
    });

    var params = {"publishedParameters" : [] };
    var publishedParameters = params.publishedParameters;
    for (var i = 0; i < form.elements.length; i++){
        var element = form.elements[i];
        var obj = {"name" : "", "value" : null}
        obj.name = element.name;
        if (element.type == "select") {
            obj.value = element[element.selectedIndex].value;
            publishedParameters.push(obj);
        } else if (element.type == "checkbox"){
            if (element.checked) {
                if (!checkboxes[element.name]){
                    checkboxes[element.name] = [];
                }
                checkboxes[element.name].push(element.value);
            }
        } else if (element.type != "button") {
            obj.value = element.value;
            if (obj.name == "BereichsID") {obj.value = element.value.split("_",1)[0];}
            publishedParameters.push(obj);
        }
    }

    FMEServer.submitSyncJob(repository, workspace, params, showResults);
}
```



**PythonCaller Parameters**

Transformer Name:

Class or Function to Process Features:

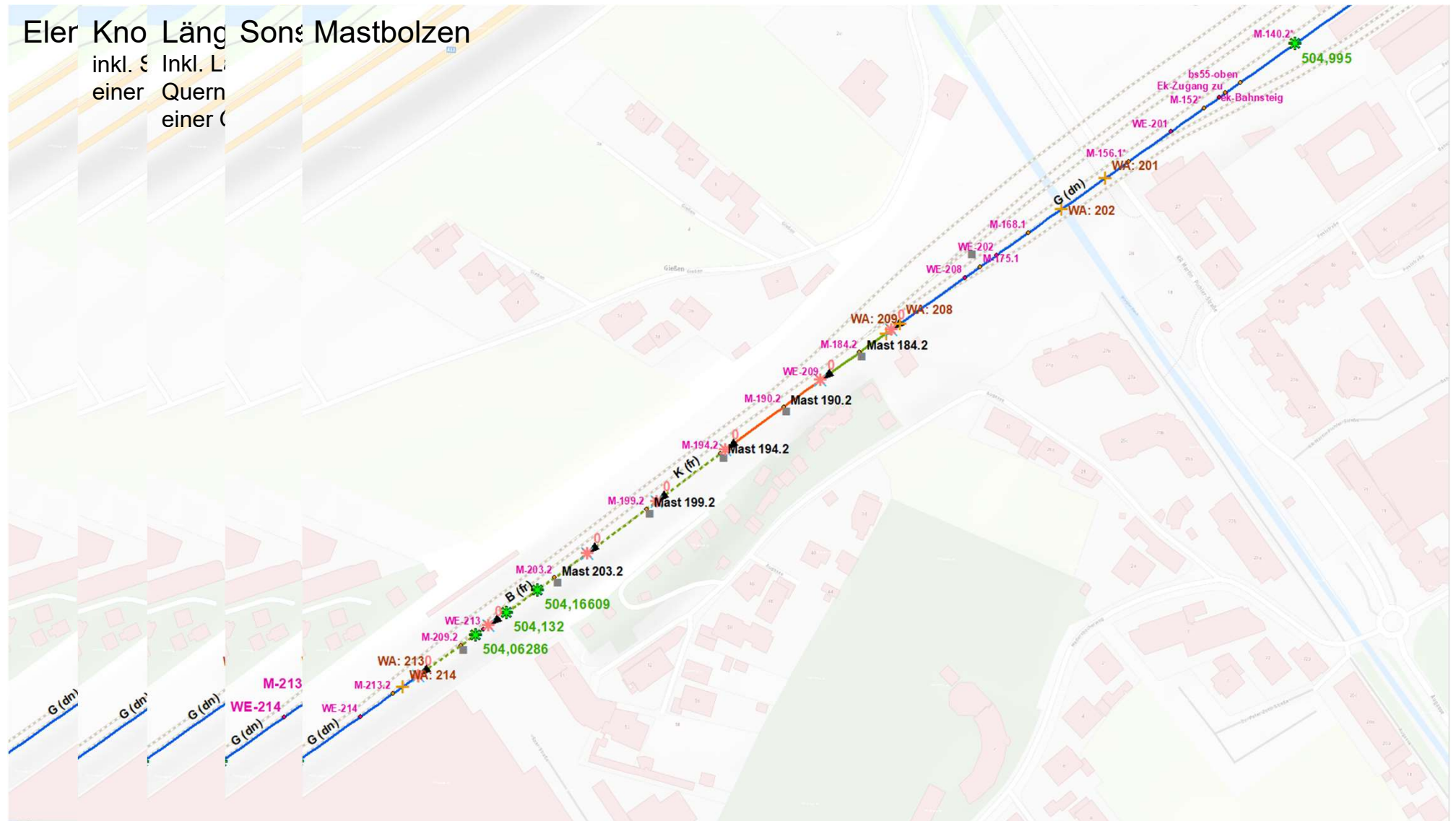
FME Feature Attributes

- \_krari
- \_kri0
- \_len
- \_lire
- \_mxcnt
- \_rad
- \_rade
- \_ri
- \_rie
- \_step
- \_wl
- \_x1
- \_x2
- \_y1

```

1 import fme
2 import fmeobjects
3 import scipy.integrate as integrate
4 import scipy.special as special
5 from numpy import cos, sin
6
7 def processFeature(feature):
8     v_kal = float(feature.getAttribute('l_kal'))
9     v_dk = float(feature.getAttribute('l_dka'))
10    v_phl = float(feature.getAttribute('l_phl'))
11    v_l = float(feature.getAttribute('_wl'))
12    def phi(x):
13        return x*(v_kal*v_l + x*x* (-140*v_phl+x* (420*v_phl+x* (7*(v_dk*v_l-60*v_phl)+x* (14*(-v_dk*v_l+10*v_phl)+5*v_dk
14    def phiy(x):
15        return cos( phi(x) )
16    def phix(x):
17        return sin( phi(x) )
18    result = integrate.quadrature(phiy, 0, 1, rtol=1e-08)
19    feature.setAttribute('_kdy',(v_l*result[0]))
20    result = integrate.quadrature(phix, 0, 1, rtol=1e-08)
21    feature.setAttribute('_kdx',(v_l*result[0]))
                
```





The screenshot shows a web browser window with the URL <https://vm00160.buero.oebb.at/infragis/synserver?project=Gleisraster&client=core&lang=de>. The browser tabs are labeled 'iGleis Output Info', 'infragis - Projekt Gleisraster', and 'infragis - Projekt Gleisraster'. The application interface includes a top navigation bar with 'START', 'NAVIGATION', 'SELEKTION', 'ZEICHNEN', and 'AUSGABE'. Below this is a toolbar with icons for zooming, moving, selecting, identifying, deleting, printing, and sending a card. The main map area shows a topographic map of the Salzburg region with a blue line representing a railway route. A large, stylized 'W' logo with a black outline and orange and yellow fill is overlaid on the map. A text box with a black border and white background is positioned over the 'W' logo, containing the text 'Vielen Dank für die Aufmerksamkeit'. On the left side, there is a 'THEMENBAUM' (Theme Tree) with a list of layers and their status (checked/unchecked). The layers include 'Gleisraster', 'Quer/Längshöhen', 'Maste', 'Zwangspunkte', 'iGIKnoten', 'M', 'WA', 'künstl.Stützpunkte', 'temp.Elemente', 'iGIElemente', 'dn', 'fr', 'gd', 'up', 'künstl.Korrekturlinien', 'iGIAbschnitte', 'ohne Gleisraster', 'Gleisraster', 'AVS', 'KM/HM', 'FSTR\_DB776', and 'STAATSGEBIET'. The 'Modus wechseln' button is at the bottom left of the theme tree.