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Visualizing Language in Space - New Approaches in Linguistic Cartography

https://www.verba-alpina.gwi.uni-muenchen.de/

4th Workshop on Visualization for the Digital Humanities
20 October 2019 - Vancouver, Canada

Outline
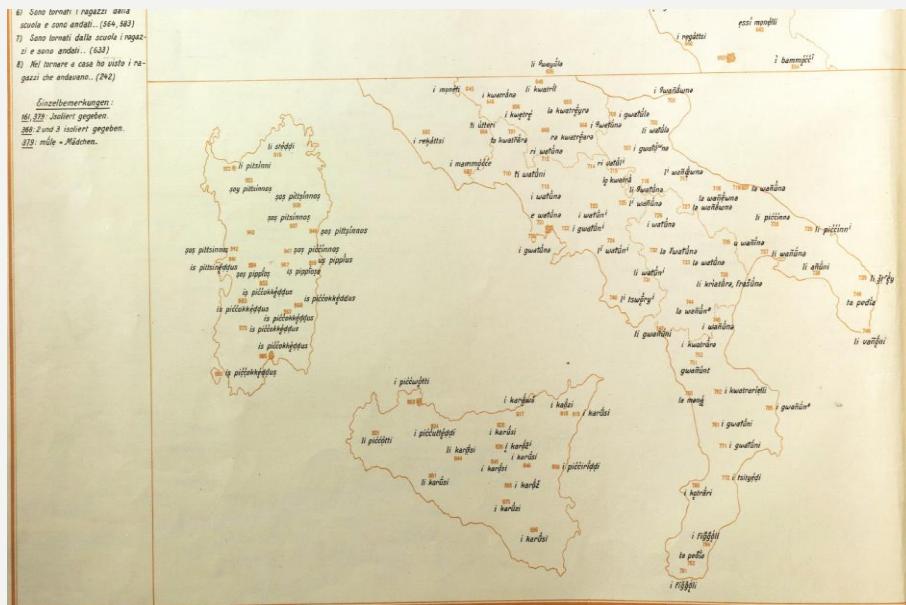
1. Traditional linguistic cartography: Pros and Cons

2. New cartographic approach of VerbaAlpina

   - short project overview
   - the interactive map and its added value

3. Visualization of linguistic data via the interactive map

   - different modes of visualization
   - trustworthiness of visualizations
   - technical background
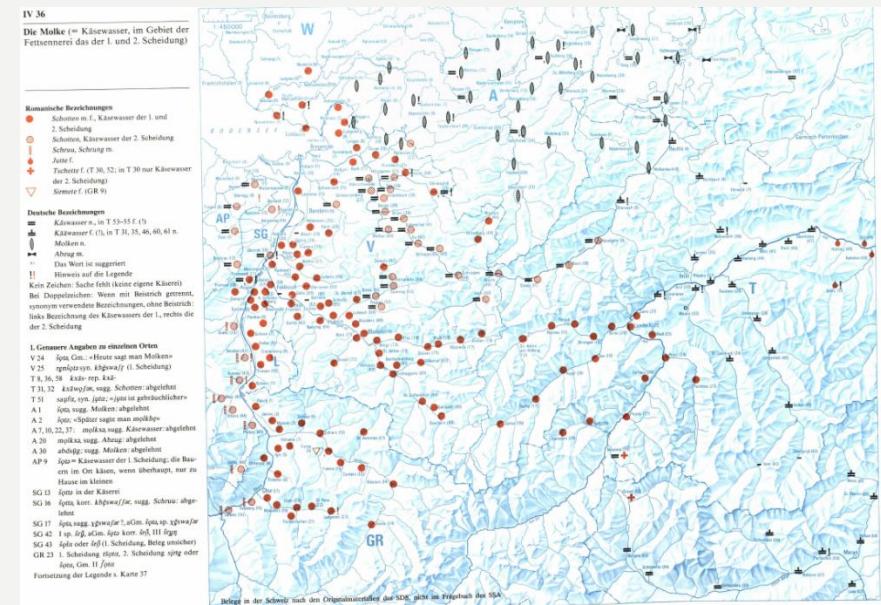
1. Traditional linguistic cartography

Two coexisting cartographic traditions:

analytic maps   synthetic maps

AIS (linguistic atlas of Italy and southern Switzerland)   VALTS (linguistic atlas of Vorarlberg)

Cons

- only onomasiological perspective
- only monolingual view on certain dialect regions
- limited accessibility (depends on place and time)

Pros

- works are permanent and can be unambigiously referenced

2. New cartographic approach of VerbaAlpina

Project Overview

- *VerbaAlpina. Der alpine Kulturraum im Spiegel seiner Mehrsprachigkeit* (VerbaAlpina. The Alpine cultural region reflected through its multilingualism)
- Funded by the German Research Foundation (DFG)
- 1st term: 10/2014-10/2017, 2nd term: 11/2017-11/2020 (perspective until 2025)
- Investigation of the multilingual Alpine region
- Combination of (geo-)linguistics and Digital Humanities (DH)

Area under investigation: The Alpine region

- Area of investigation is limited to the territorial borders defined by the

Alpine convention

- surface area of 190,600 km², encompasses parts of six different countries (D, A, CH, I, F, SLO) and two entire countries (FL, MC)

- ethnographic and topographic homogeneity and strong linguistic heterogeneity → 3 language families

Three conceptual domains

project years	1	2	3	4	5	6	7	8	9
calendar year	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
quarter	i, ii, iii, iv	i, ii, iii, iv	i, ii, iii, iv	i, ii, iii, iv	i, ii, iii, iv	i, ii, iii, iv	i, ii, iii, iv	i, ii, iii, iv	i, ii, iii, iv	i, ii, iii, iv

project phase	I		II		III	
focus	**culture**		**nature**		**modern life**	
	• alpine pasture farming • milk processing		• landscape formations • weather • fauna • flora		• ecology • tourism	

Data

Multiple different sources

- printed atlases/dictionaries (georeferenced)

- digital material from project partners

- crowdsourcing

Data access via
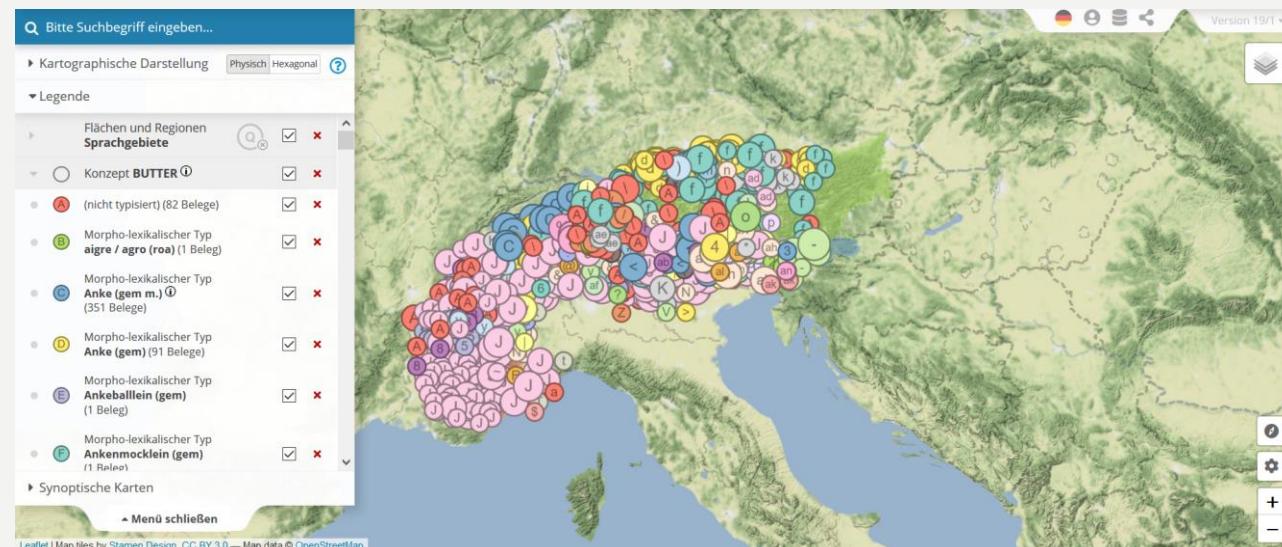
- interactive map

- Lexicon Alpinum

- API

Data access via

- interactive map   →   **visualization of data**

- Lexicon Alpinum

- API

The interactive map and its added value

- integration of the two visualization traditions (synthetic + analytic)

- integration of different data sources
  → onomasiological **and** semasiological perspective

- simplifies a cross-national and cross-linguistic investigation + overcomes the restriction of traditional geolinguistics to political units (nation-states)

- accessible anytime and anywhere thanks to its online format

- qualitative and quantitative visualization

- function to create synoptic (i.e. collective) maps

Challenge:

- durability of data

- meet FAIR-principles:

> **F**_indable
> **A**_ccessible
> **I**_nteroperable
> **R**_eusable

3. Visualization of linguistic data via the interactive map

- integration of features of analytic and synthetic maps
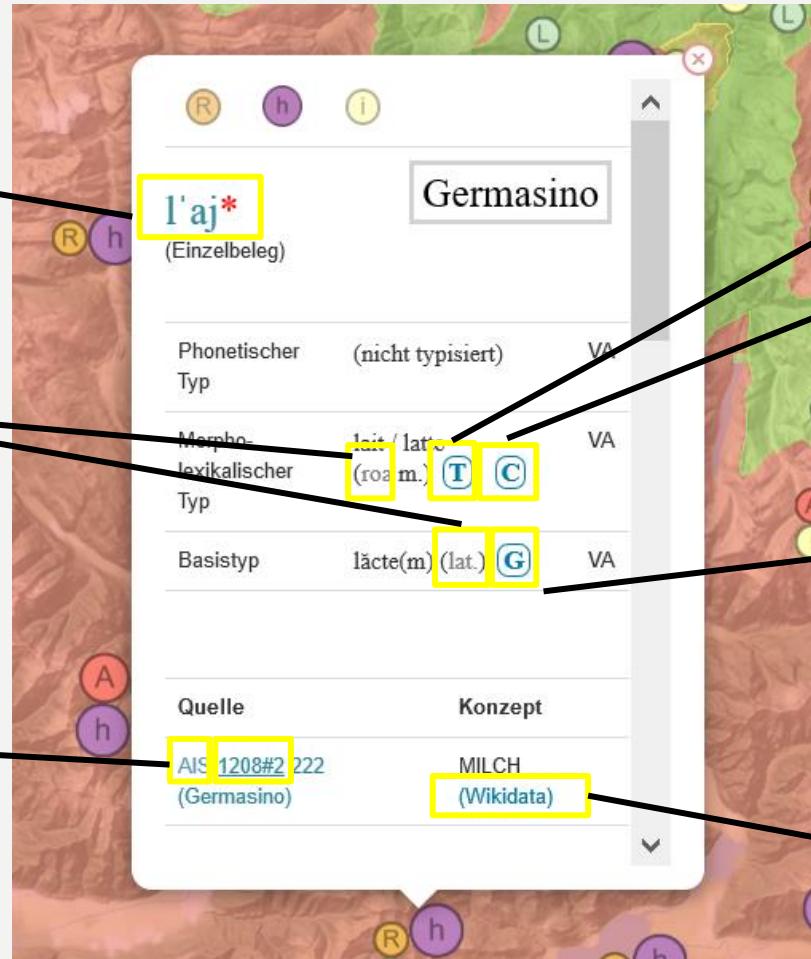
Default view: synthetic map with point symbols + an appropriate legend

For each data point access to: full linguistic and meta-information including the source, unification steps that have been undertaken (IPA), if possible: online version of the source is linked

→ lack of transparency of traditional synthetic maps solved by interactivity

→ Mantra: „overview first, zoom and filter, then details on demand"
  (Shneiderman 1996, 336-343)
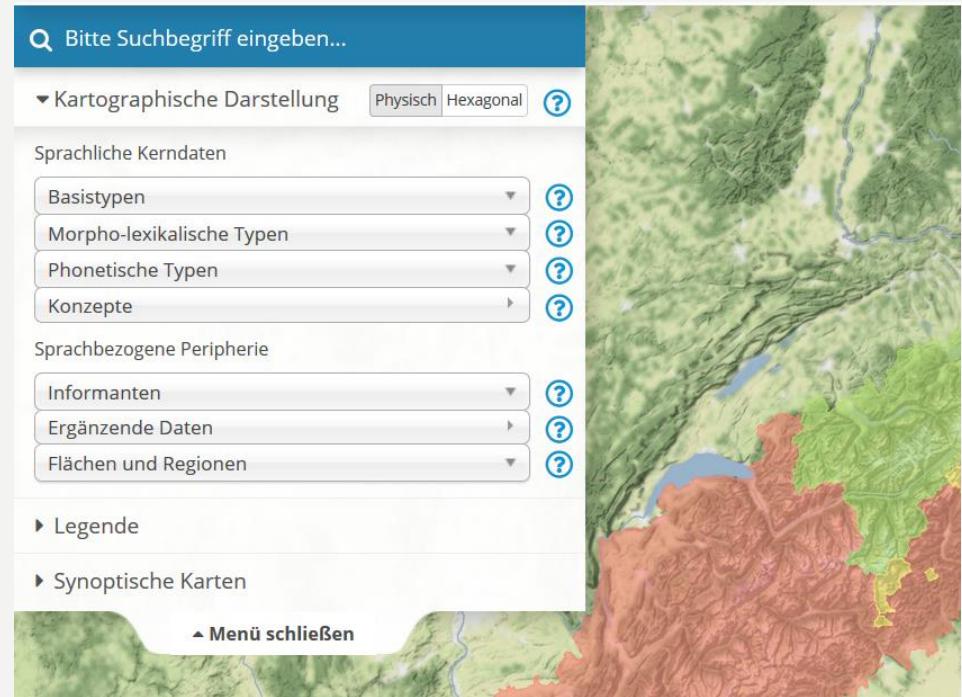
Detail view of one specific data point

IPA

Darstellung: IPA VA
DST Quelle: láy

ISO Codes

source + online version

il siero di burro

G. Tisato - NavigAIS - http://www3.pd.istc.cnr.it/navigais-web/?map=1208

Dictionaries

Treccani: latte

CNRTL: lait

Etymologic dictionary

Georges: lac 2, 525

Wikidata
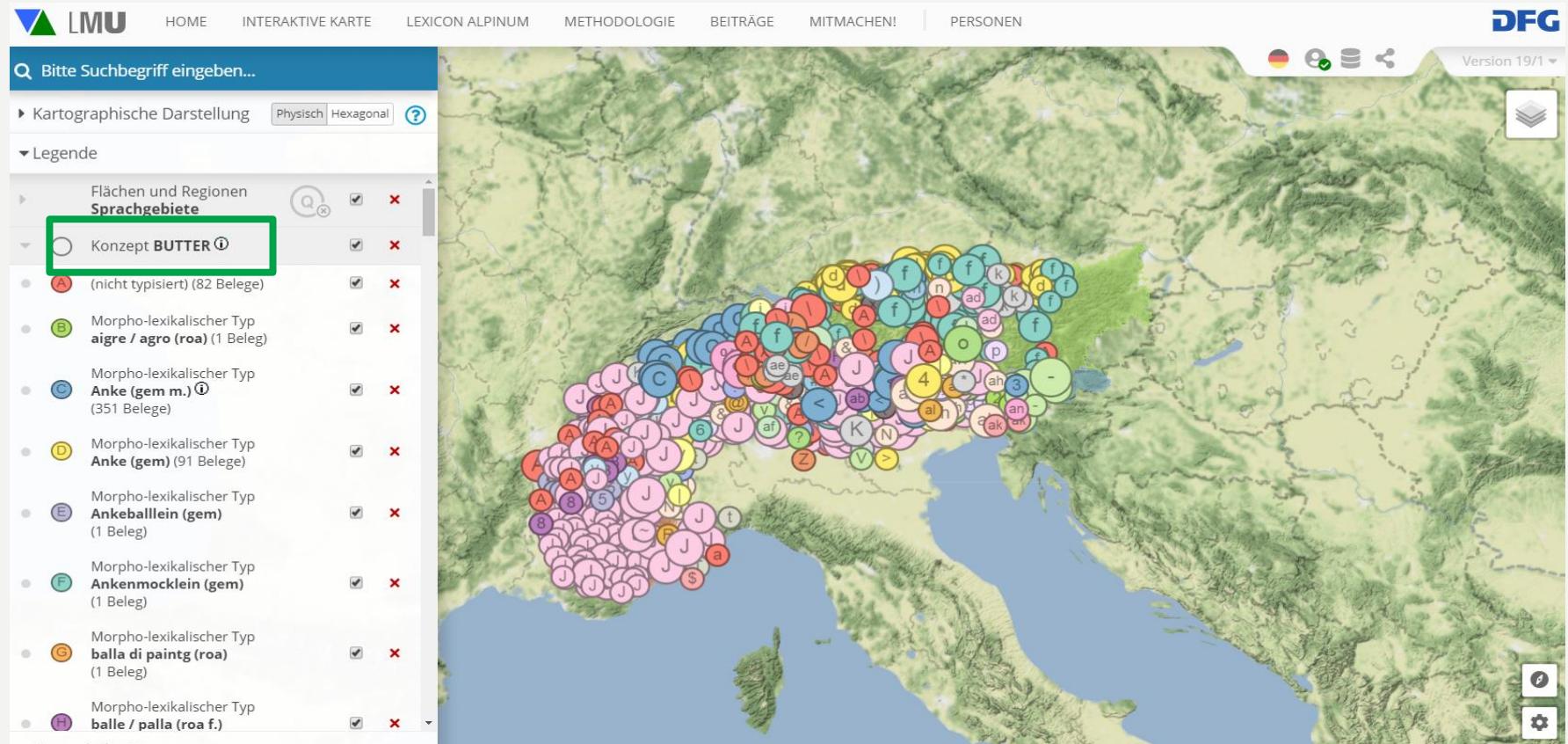
- onomasiological and
  semasiological perspective
   by using appropriate filters

- geographical/physical (NUTS 3 boundaries) vs. abstract (hexagons)

- qualitative vs. quantitative
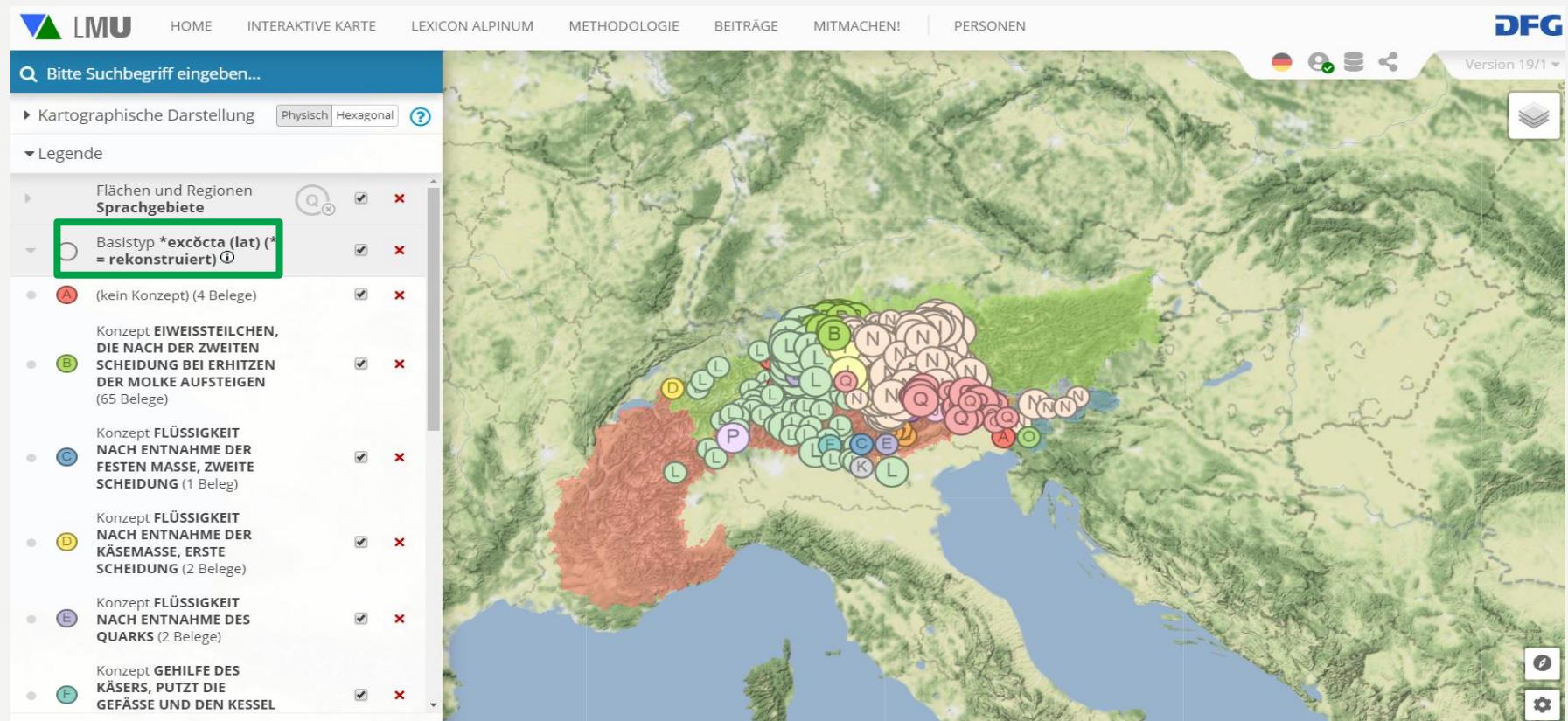
geographical qualitative (onomasiological perspective)
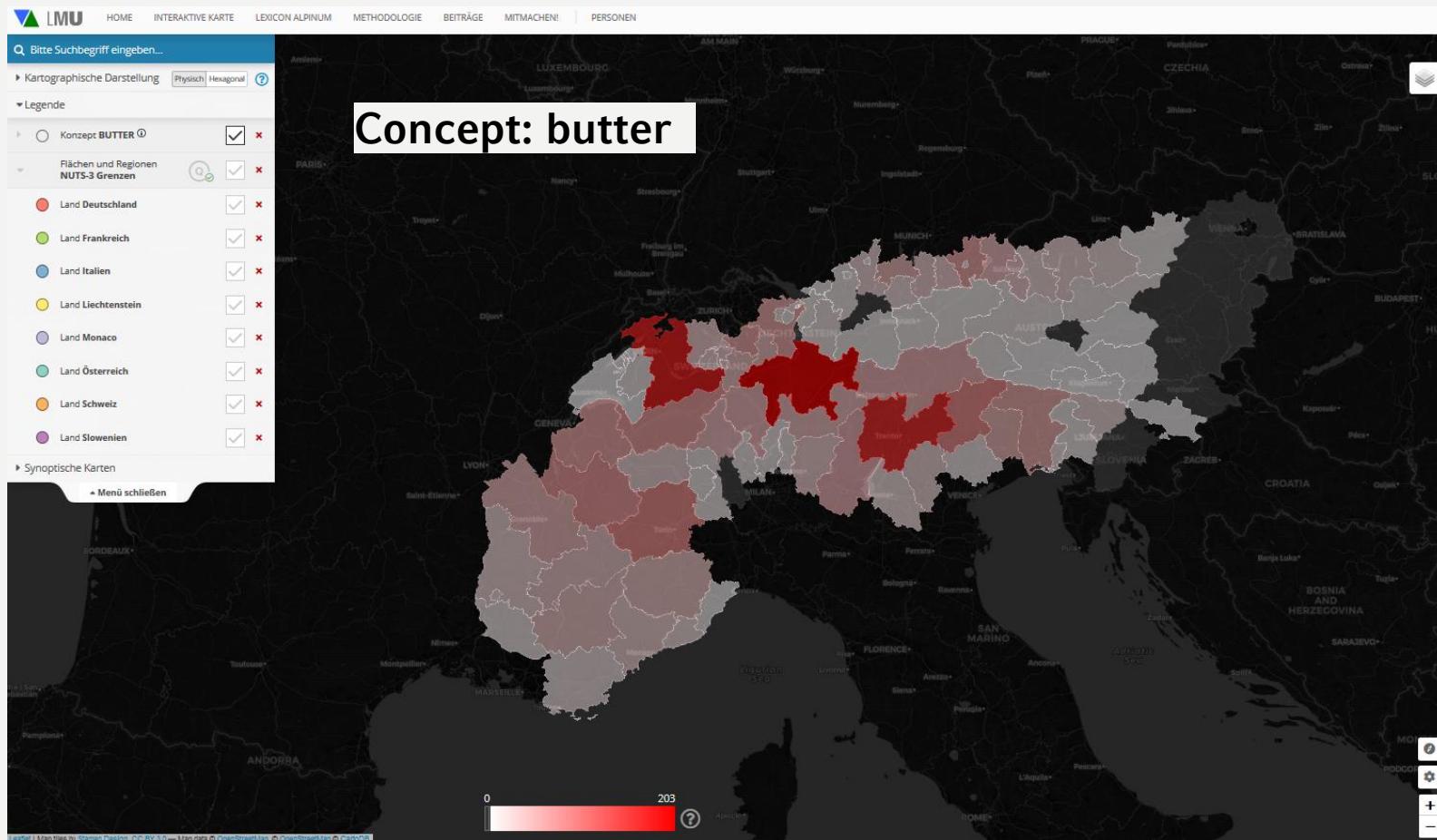
geographical qualitative (semasiological perspective)
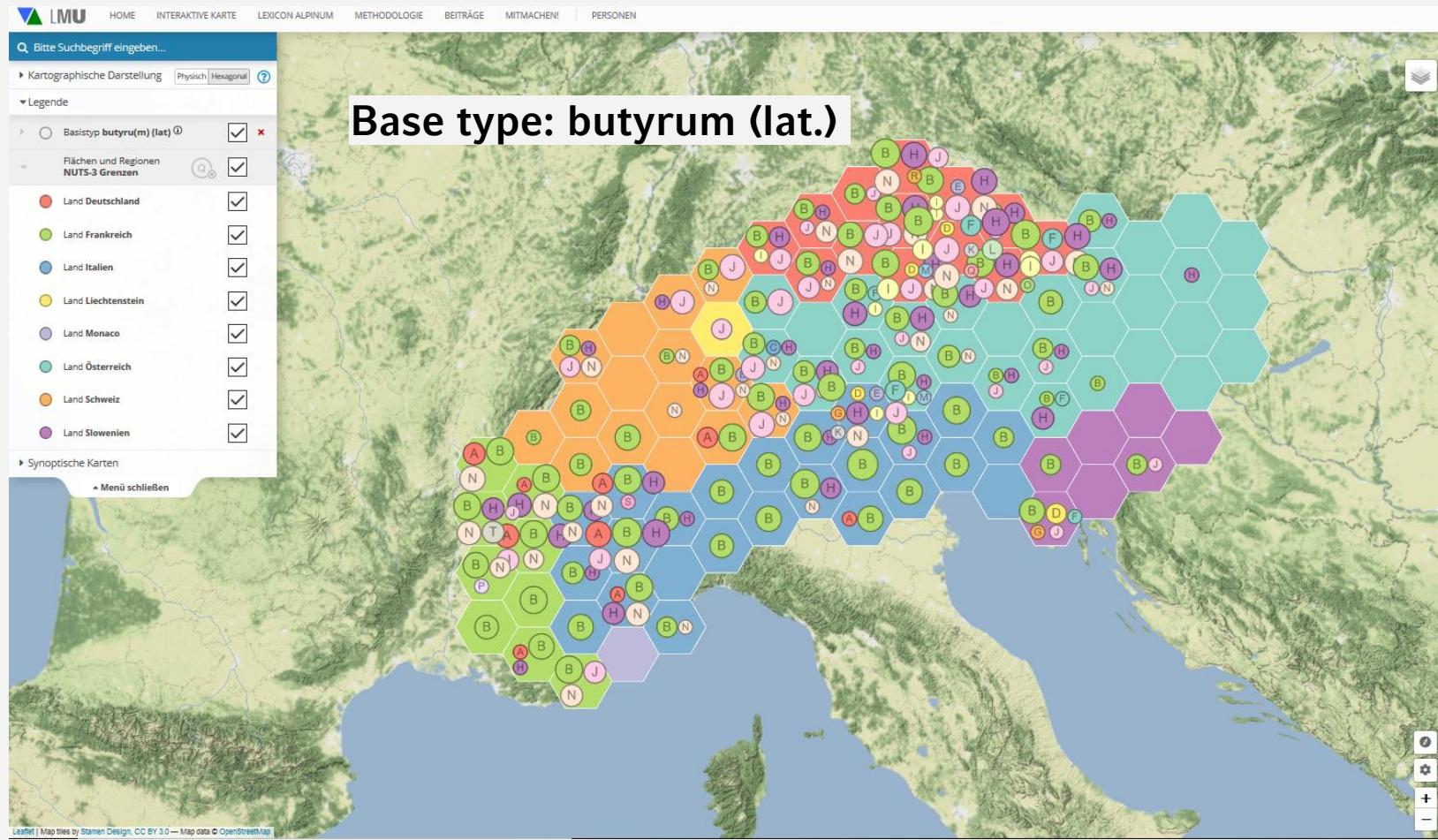
geographical quantitative (onomasiological perspective)

Concept: butter
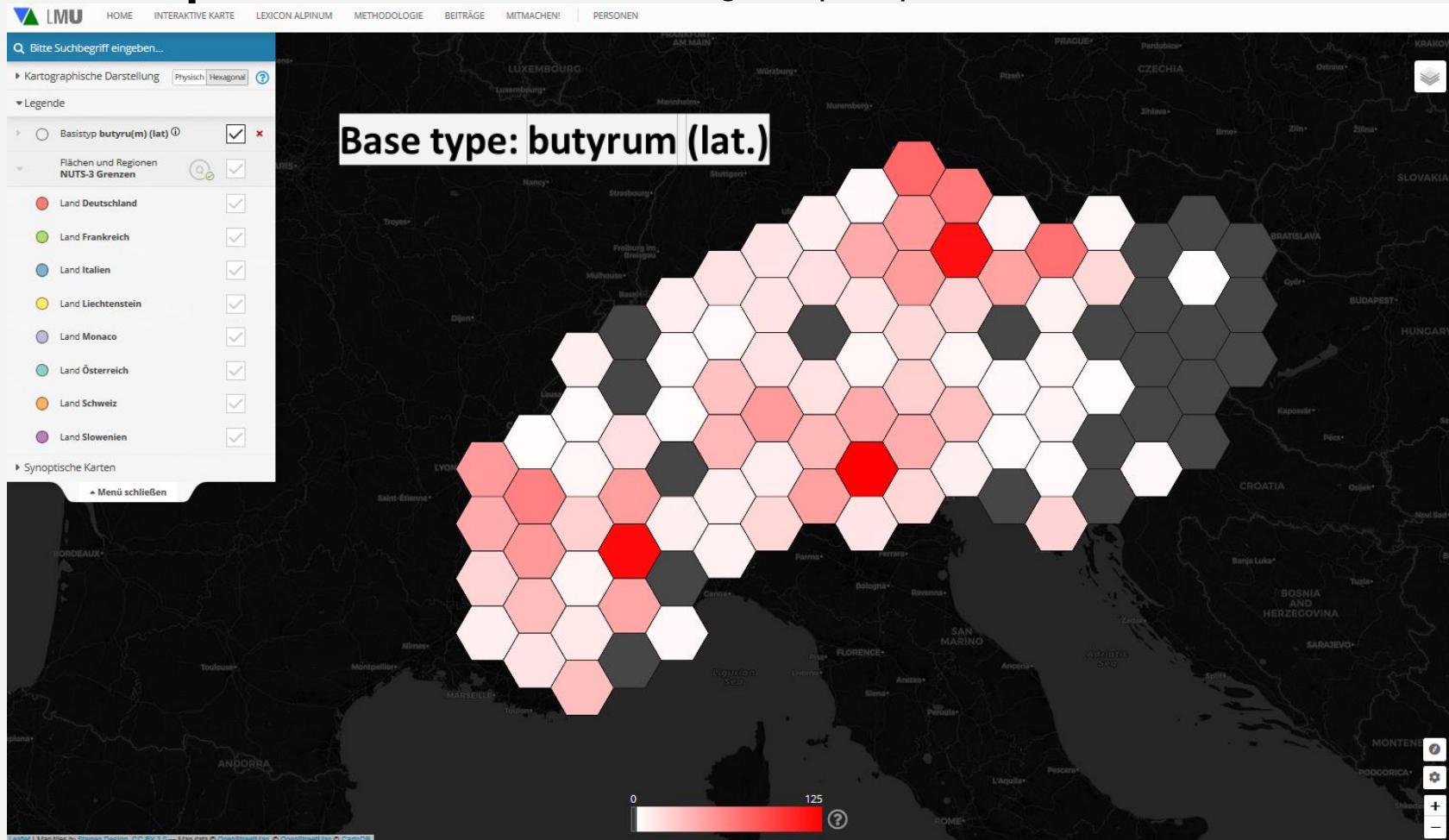
abstract qualitative (onomasiological perspective)

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LUDWIG-
MAXIMILIANS-
UNIVERSITÄT
MÜNCHEN

abstract quantitative (onomasiological perspective)

Trustworthiness of visualizations

through…

- multiple filters on the full data set

- different displaying methods

- in-depth view into the underlying utterances of the informants

Technical background

- exclusively web-based project using open-source or free software

- website based on the content management system Wordpress

- interactive map module based on JavaScript and PHP with a MySQL backend

- basis for each visualization:
  a sound/trustworthy data model (relational database)

- Frontend: libraries Leaflet for the basic map functionalities + PixieJS (uses WebGL) for the map overlays

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Thank you for your attention!

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