

# Simulated Segment Evolution using the TKF91 Model

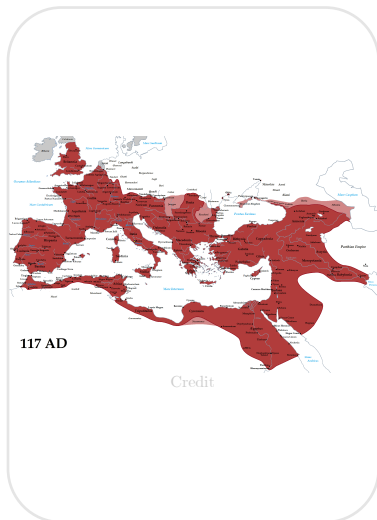
John Huelsenbeck

# Introduction

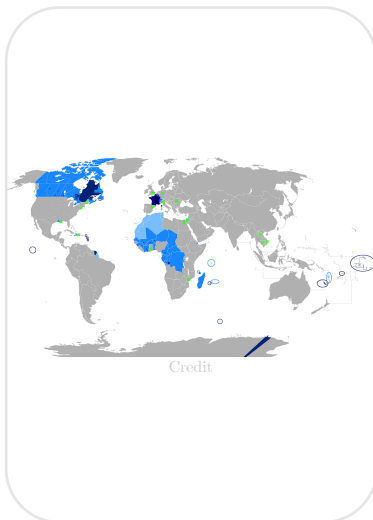
In this paper, we attempt to do the impossible!

# Languages

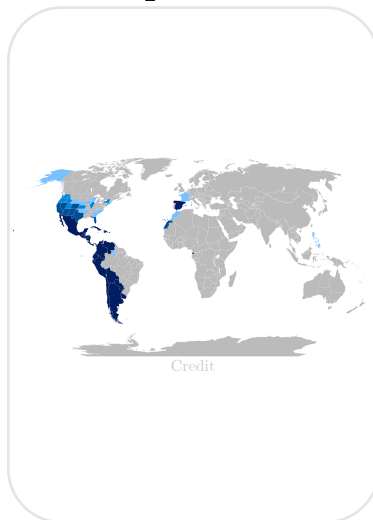
**Latin**



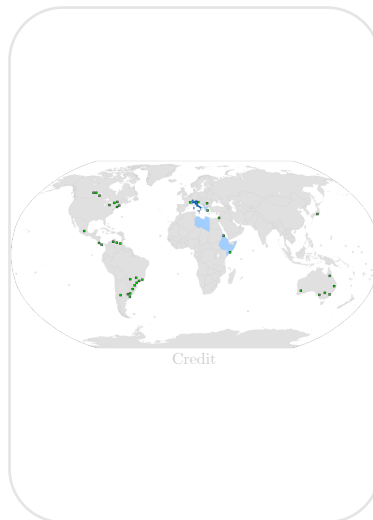
**French**



**Spanish**



**Italian**



**Brazilian Portuguese**



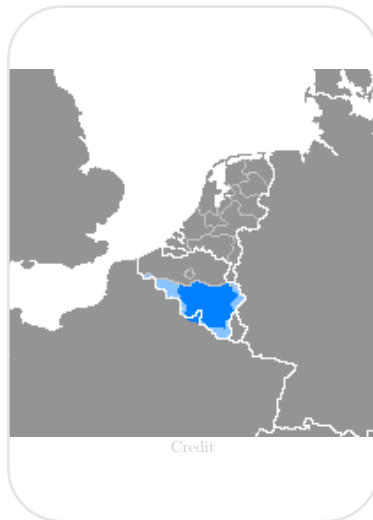
**Portuguese**



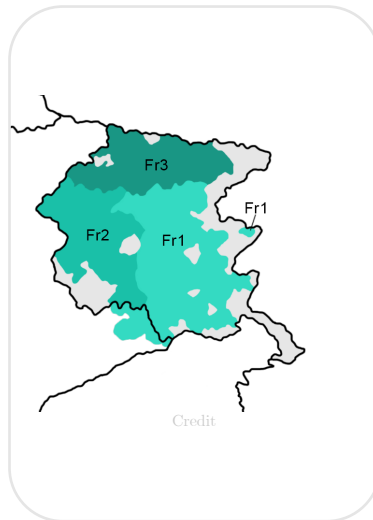
**Catalan**



**Walloon**



**Friulian**

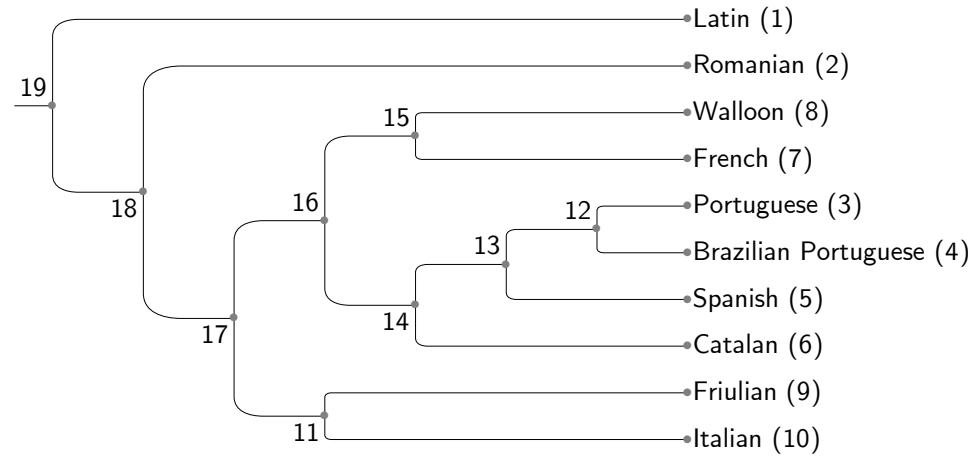


**Romanian**



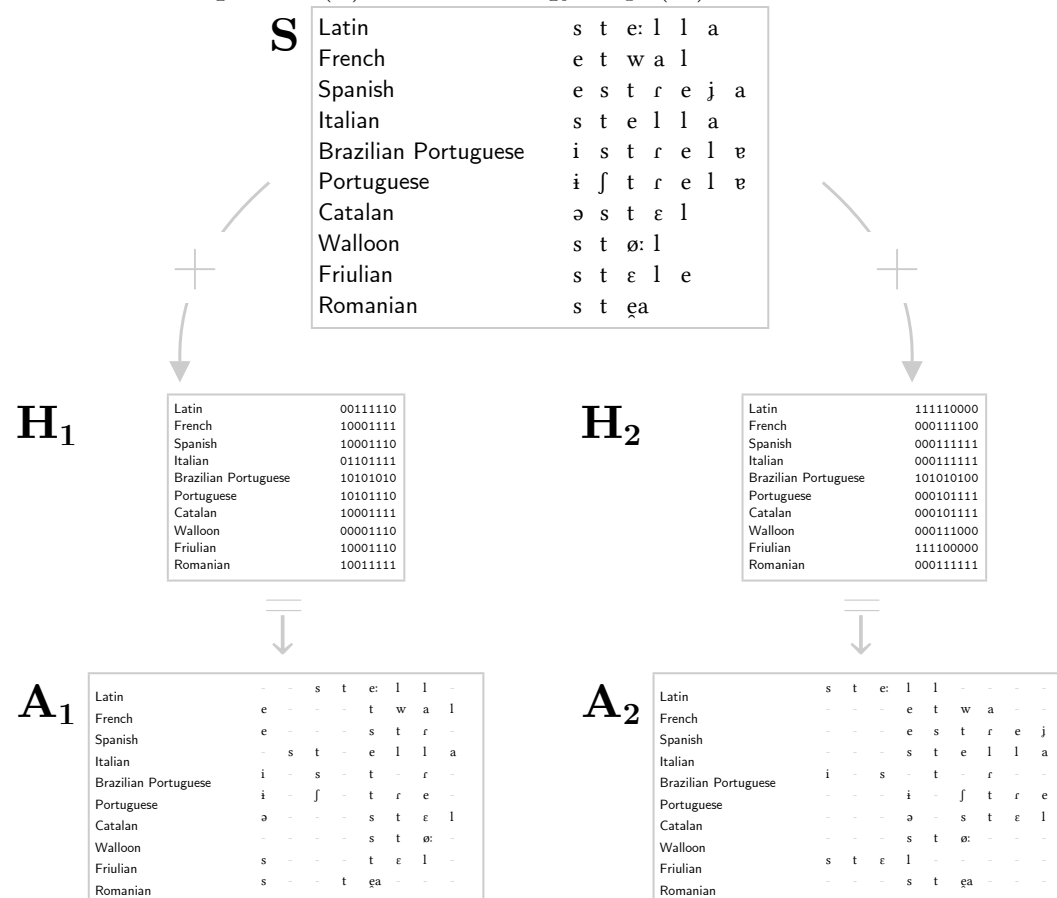
# Example Tree

An example tree showing the relationships of  $N = 10$  languages.



# Alignment

Alignments (**A**) are formed from the observed segments (**S**) and a homology map (**H**).



# Character Assignments

Each segment gets a different number

|    |                |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                |    |   |
|----|----------------|----|----|----|----|----|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----------------|----|---|
| 0  | e              | 1  | g  | 2  | o: | 3  | ʒ | 4  | ə  | 5  | j  | 6  | o  | 7  | i  | 8  | w  | 9  | ɔ  | 10 | dʒ | 11 | ɪ  | 12 | j  | 13 | k <sup>w</sup> | 14 | s |
| 15 | k              | 16 | i: | 17 | m  | 18 | n | 19 | ẽj | 20 | ẽj | 21 | ɸj | 22 | d  | 23 | a  | 24 | ɪ  | 25 | ɛ  | 26 | ɛ: | 27 | ɸj |    |                |    |   |
| 28 | ã              | 29 | ẽ  | 30 | u  | 31 | t | 32 | ẽ  | 33 | u: | 34 | œ  | 35 | ũ  | 36 | õ  | 37 | ɳ  | 38 | ø  | 39 | oj | 40 | ɸ  |    |                |    |   |
| 41 | ø:             | 42 | aj | 43 | ɐ  | 44 | r | 45 | e: | 46 | ɾ  | 47 | ɑ  | 48 | ɾ  | 49 | ej | 50 | ẽ  | 51 | θ  | 52 | ĩ  | 53 | g  | 54 | ɳ              |    |   |
| 55 | l              | 56 | õ  | 57 | ʎ  | 58 | ɣ | 59 | a: | 60 | p  | 61 | ã  | 62 | ɐj | 63 | h  | 64 | b  | 65 | v  | 66 | z  | 67 | x  |    |                |    |   |
| 68 | β              | 69 | ɛa | 70 | ɸ  | 71 | ð | 72 | y  | 73 | ɾ  | 74 | ɔa | 75 | ɸ  | 76 | c  | 77 | ts | 78 | ɸ  | 79 | ɛj | 80 | f  |    |                |    |   |
| 81 | g <sup>w</sup> | 82 | ẽɸ |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                |    |   |

# Partition Assignments

David's basic rules

## 1 Nasal Vowel

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ã ẽ ĩ œ ù õ ẽ ĩ ã ã

## 2 Vowel

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e o: ə o i ɔ ɪ i: ẽĩ ẽĩ a i ε ε: u u: ø oɹ ø: aɹ ɐ e: ɑ eɹ a: ɐɹ ɤ a y ɔ a εɹ ẽɹ

## 3 Consonant Group 1

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w j m n r l

## 4 Consonants

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g ʒ ʝ ɟ kʷ s k ʈ ɖ d ʈ t ɳ ʃ ʁ ɾ θ g ɲ ʎ ɣ p h b v z x β ʝ ɖ ʁ ɥ c ts ʈ f gʷ

## Maximum Clade Credibility

0

Changes per Branch



# Questions

