

Universal Multiple-Octet Coded Character Set  
International Organization for Standardization  
Organisation Internationale de Normalisation  
Международная организация по стандартизации

**Doc Type:** Working Group Document  
**Title:** Proposal to add six phonetic characters to the UCS  
**Source:** Richard S. Cook, Jr., and Michael Everson  
**Status:** Expert Contribution  
**Date:** 2001-09-20

## A. Administrative

### 1. Title

Proposal to add six phonetic characters to the UCS.

### 2. Requester's name

Richard S. Cook, Jr., and Michael Everson.

### 3. Requester type

Expert contribution.

### 4. Submission date

2001-09-20

### 5. Requester's reference

#### 6a. Completion

This is a complete proposal.

#### 6b. More information to be provided?

No.

## B. Technical – General

### 1a. New script? Name?

No.

### 1b. Addition of characters to existing block? Name?

Yes. IPA and Latin Extended-B (proposed code points: U+0221, U+0234, U+0235, U+0236, U+02AE, U+02AF)

### 2. Number of characters

6.

### 3. Proposed category

Category A.

### 4. Proposed level of implementation and rationale

Level 1. Base character with no diacritics.

### 5a. Character names included in proposal?

Yes.

### 5b. Character names in accordance with guidelines?

Yes.

### 5c. Character shapes reviewable?

Yes

### 6a. Who will provide computerized font?

Michael Everson.

### 6b. Font currently available?

Yes.

### 6c. Font format?

TrueType.

**7a. Are references (to other character sets, dictionaries, descriptive texts, etc.) provided?**

Yes.

**7b. Are published examples (such as samples from newspapers, magazines, or other sources) of use of proposed characters attached?**

Yes.

**8. Does the proposal address other aspects of character data processing?**

No.

## **C. Technical – Justification**

**1. Contact with the user community?**

Yes. The Sino-Tibetan Etymological Dictionary and Thesaurus (STEDT) Project.

**2. Information on the user community?**

Chinese and Sino-Tibetanist linguists.

**3a. The context of use for the proposed characters?**

Phonetic transcription.

**3b. Reference**

**4a. Proposed characters in current use?**

Yes.

**4b. Where?**

At least in China and North America.

**5a. Characters should be encoded entirely in BMP?**

Yes.

**5b. Rationale**

Keeping them with other Latin characters.

**6. Should characters be kept in a continuous range?**

No.

**7a. Can the characters be considered a presentation form of an existing character or character sequence?**

No.

**7b. Where?**

**7c. Reference**

**8a. Can any of the characters be considered to be similar (in appearance or function) to an existing character?**

No.

**8b. Where?**

**8c. Reference**

**9a. Combining characters or use of composite sequences included?**

No.

**9b. List of composite sequences and their corresponding glyph images provided?**

No.

**10. Characters with any special properties such as control function, etc. included?**

No.

## **D. Proposal**

At present although [ç, z, ʝ, ɹ] used in Sino-Tibetanist linguistics are to be found in the Unicode Standard 3.0, at U+0255, U+0291, U+027F, and U+0285 respectively, the six characters [d̥, l̥, n̥, t̥, ɸ, ɸ̥] are not.

**1. Alveolo-palatal consonants.** As Pullum and Ladusaw (*Phonetic Symbol Guide*, second edition, 1996, ISBN 0-226-68536-5) report under their entry for [ç] (p. 33):

## IPA USAGE

Voiceless “alveolo-palatal” median laminal fricative. Articulated further forward than [ç] (true palatal) but not as far forward as [ʃ] (palato-alveolar), and articulated laminally (with the flat blade of the tongue) rather than apically (with the tip of the tongue, as in retroflex [ʂ]).

This character [ç] is used to represent the Hanyu Pinyin *x*-initial of Mainland Standard Chinese (MSC, as in the word *xiàn* ‘now’). To this it may be added that, according to Wu Zongji (1992:77) key differences between the [ʃ] as in English and MSC [ç] are that, whereas the English sound involves a certain degree of lip-rounding and troughing (grooving) of the tongue, the Chinese sound does not: medial tongue closure is rather tight with [ç], and the primary point of friction is rather back in comparison with [ʃ]. Note also that this [ç] initial is always found with a following high front vowel, and so is in complementary distribution with MSC’s retroflex [ʂ].

What is being distinguished for [ç, ʒ] is a place of articulation, such that the following four places are distinguished in the continuum from alveolum to palate:

### ALVEOLAR, PALATO-ALVEOLAR, ALVEOLO-PALATAL, PALATAL.

Although IPA [ç, ʒ] are apparently marginalized in the “Other Symbols” part of the IPA chart, the “curly-tail” manner of writing in these consonants does, in fact, lend itself to the same logical extension as that seen in the writings of symbols for other places of articulation, e. g. as seen in the IPA symbols for the retroflex series [ɖ, ɗ, ɳ, ʈ, ʣ, ʡ, ʣ]. Pullum and Ladusaw call this “right tail” a “diacritic for retroflexion” (1996:177; “right tail” seems to us to be a “modification” rather than a “diacritic” per se). By the same reasoning the “curly-tail” mark itself could be viewed as a modification (or “diacritic”). Just as the alveolar [d, l, n, t] symbols may receive the “diacritic for retroflexion” to become apico-postalveolar retroflex [ɖ, ɗ, ɳ, ʈ], so too [ç, ʒ] are generated by the same principle, after the pattern of [ç, ʒ] to indicate laminal alveolo-palatals. This appears, at any rate, to have been the reasoning employed by linguists in their creation and usage of these [ɖ, ɗ, ɳ, ʈ] curly-tailed symbols. These symbols are employed by linguists working with Chinese and Sino-Tibetan linguistics, in apparent conformity with IPA principles. It is proposed here to encode:

U+0221	[ɖ] LATIN SMALL LETTER T WITH CURL
U+0234	[ɗ] LATIN SMALL LETTER D WITH CURL
U+0235	[ɳ] LATIN SMALL LETTER L WITH CURL
U+0236	[ʈ] LATIN SMALL LETTER N WITH CURL

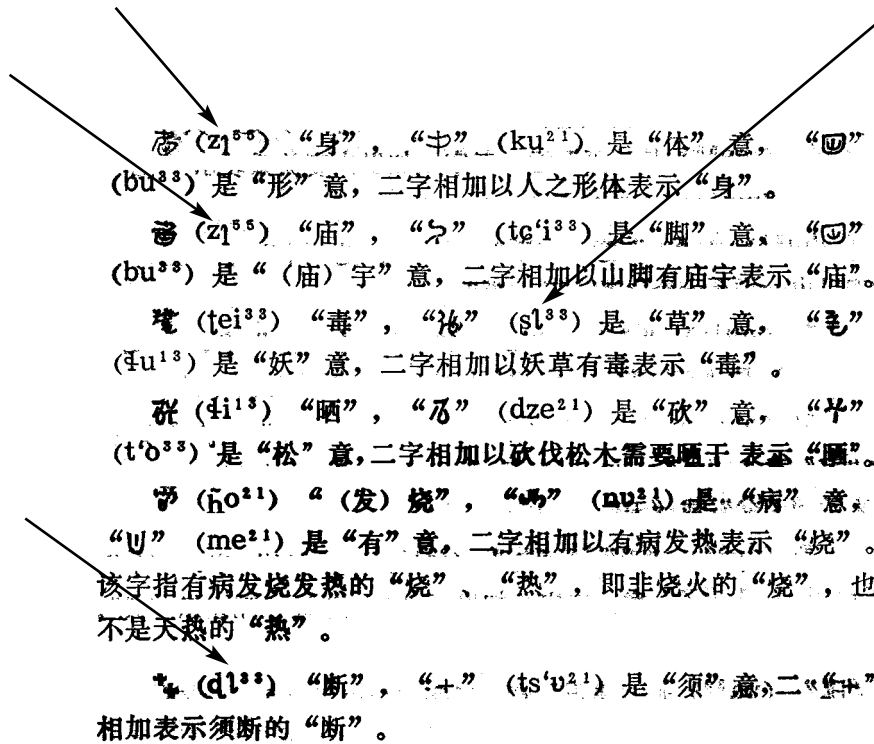
**2. Rounded apical vowels.** While [ɹ, ɻ] are encoded (U+027F LATIN SMALL LETTER REVERSED R WITH FISHHOOK and U+0285 LATIN SMALL LETTER SQUAT REVERSED ESH), and are noted in Unicode 3.0 for Sinological use, two things may be observed.

1 These two characters [ɹ, ɻ], which represent *unrounded* apical vowels have *rounded* counterparts [ɽ, ɽ̥] which are as yet unencoded in the UCS. The glyphs are related to, but are not identical with, [ɥ] U+0265 LATIN SMALL LETTER TURNED H. They can be seen on page 5 below in the chart from Wu Zongji (1992), and are also described in Pullum and Ladusaw (1996:81-81). It is proposed here to encode:

U+02AE	[ɽ] LATIN SMALL LETTER TURNED H WITH FISHHOOK
U+02AF	[ɽ̥] LATIN SMALL LETTER TURNED H WITH FISHHOOK AND TAIL

2 The glyphs for [ɹ, ɻ] shown in the Unicode Standard 3.0 are inconsistent with Sino-Tibetanist use. These letters *should* descend below the baseline, to the depth of the letter <j>. It may be possible

that U+027F was derived from U+027E LATIN SMALL LETTER R WITH FISHHOOK – though it can be noted that Pullum and Ladusaw identify this typographically as a turned small capital J (1996:98) as well as describing it as an *r* with its top left serif removed (1996:161). In any case, in current Sino-Tibetanist use it has grown to the same depth so that all four vowels form a set: [ɿ, ʐ, ɥ, ɹ]. Typographically there are some interesting variations to be found; for instance in *Yi wen lun* (1993) we find that both [ɿ, ʐ] have the same length, though the second one, unusually, sits on the baseline rather than hanging from the x-height line (not to be recommended as this could easily be confused with ʃ U+0283 LATIN SMALL LETTER ESH).


 𠃉 (zɿ<sup>55</sup>) “身”，“𠃊” (ku<sup>21</sup>) 是“体”意，“𠃋” (bu<sup>33</sup>) 是“形”意，二字相加以人之形体表示“身”。  
 𠃌 (zɿ<sup>55</sup>) “庙”，“𠃍” (te<sup>133</sup>) 是“脚”意，“𠃋” (bu<sup>33</sup>) 是“(庙)宇”意，二字相加以山脚有庙宇表示“庙”。  
 𠃎 (tei<sup>33</sup>) “毒”，“𠃏” (sɿ<sup>33</sup>) 是“草”意，“𠃐” (ɥu<sup>13</sup>) 是“妖”意，二字相加以妖草有毒表示“毒”。  
 𠃑 (ɬi<sup>13</sup>) “晒”，“𠃒” (dze<sup>21</sup>) 是“砍”意，“𠃓” (t'o<sup>33</sup>) 是“松”意，二字相加以砍伐松木需要晒干表示“晒”。  
 𠃔 (ho<sup>21</sup>) “(发)烧”，“𠃕” (nu<sup>21</sup>) 是“病”意，“𠃖” (me<sup>21</sup>) 是“有”意，二字相加以有病发热表示“烧”。该字指有病发烧发热的“烧”、“热”，即非烧火的“烧”，也不是天热的“热”。  
 𠃗 (dɿ<sup>33</sup>) “断”，“𠃘” (ts'u<sup>21</sup>) 是“须”意，二字相加以表示须断的“断”。

fj f r r u u y y s d

zɿ dɿ t'sɿ tɿ

辅音	部位		双唇	齿唇	齿间	舌尖前	舌尖后	舌叶 (舌尖及面)	舌面前	舌面中	舌根 (舌面后)	小舌	喉壁	喉
	方法	气												
塞	清	不送气	p			t	l		t	c	k	q		p
	浊	送气	p'			t'	l'		t'	c'	k'	q'		p'
	清	不送气	b			d	tʂ	tʃ	tʃ	ɟ	g	ɣ		
	浊	送气	b'			d'	tʂ'	tʃ'	tʃ'	ɟ'	g'	ɣ'		
塞擦	清	不送气		pf	tθ	ts	tʂ							
	浊	送气		pf'	tθ'	ts'	tʂ'							
鼻	清	不送气		bv	dθ	dʒ	ɲ		ɲ		ŋ	ŋ		
	浊	送气		bv'	dθ'	dʒ'	ɲ'							
滚	清	不送气	m			n	ɳ				ŋ			
	浊	送气				n'	ɳ'							
闪	清	不送气				ɳ	ʃ							
	浊	送气				ɳ'	ʃ'							
边	清	不送气				ɳ	ʃ							
	浊	送气				ɳ'	ʃ'							
边擦	清	不送气				ɳ	ʃ							
	浊	送气				ɳ'	ʃ'							
擦	清	不送气		f	θ	s	ʂ	ʃ	ç		x	χ	h	
	浊	送气		v	ð	z	ʂ'	ʃ'	j		y	ʁ	ɦ	
无擦通音及半元音	清	不送气	w			ɰ	ɰ		j(ɥ)		(w)			
	浊	送气				ɰ'	ɰ'							
元音	高		圆唇元音			舌尖元音后			舌面元音前		舌根元音后			
	半高		(ɥɥɥu)			ɨ	ɨ'		iy	iy	iu	iu		
	半低		(əo)						e	e	o	o		
	低		(ɑɑ)						ɛ	ɛ	ɔ	ɔ		

n° (WFS)	69	73	74	76
pHM (WFS)	*d	* h	*	*tsh
pHM (HP)	*d	* h	*  / -	*-
[1] <i>làyíping</i>	t-	—	—	ç-
[2] <i>yánghào</i>	t-	lh-	l-	xh-
[7] <i>dànnánshān</i>	t-	l-	l-	tsh-
[12] <i>dàshānjiǎo</i>	—	—	—	—
[13] <i>yējīpō</i>	zç-	l-	l-	s- II
[15] <i>fēngxiàng</i>	tç-	l-	l-	ç-
[16] <i>shíménkān</i>	d -	l-	l-	tsh-
[17] <i>jiǎdìng</i>	t-	l-	l-	sh-
[18] <i>bǎituō</i>	t-	l-	l-	s-
[19] <i>tiěshí</i>	t-	l-	l-	tsh-
[21] <i>gézèng</i>	t-	l-	l-	—
[22] <i>jiǎotuō</i>	ç-	l-	l-	sy-

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	大	烧 烧山	轻 年轻
养 蒿  h	lhə <sub>(1)</sub> <sup>(1)</sup>	—	—
吉 卫 (ɿ)	—	—	—
先 进	lo <sub>(1)</sub> <sup>(1)</sup>	leu <sub>(3)</sub> <sup>(3)</sup>	lua <sub>(7)</sub> <sup>(7)</sup>
石 门	lo <sub>(1)</sub> <sup>(1)</sup>	ley <sub>(3)</sub> <sup>(3)</sup>	la <sub>(7)</sub> <sup>(7)</sup>
青 岩	lau <sub>(1)</sub> <sup>(1)</sup>	lau <sub>(3)</sub> <sup>(3)</sup>	lo <sub>(7)</sub> <sup>(7)</sup>
高 坡  h	lhə <sub>(1)</sub> <sup>(1)</sup>	lhə <sub>(3)</sub> <sup>(3)</sup>	lhə <sub>(7)</sub> <sup>(7)</sup>
宗 地	lo <sub>(1b)</sub> <sup>(1b)</sup>	le <sub>(3b)</sub> <sup>(3b)</sup>	la <sub>(7b)</sub> <sup>(7b)</sup>
复 员	lu <sub>(Δ)</sub> <sup>(Δ)</sup>	—	—
枫 香  h	lhau <sub>(1)</sub> <sup>(1)</sup>	—	—
七 百 弄 ɿ	ɿo <sub>(1)</sub> <sup>(1)</sup>	—	—
瑶 里  hj	lhjuo <sub>(1)</sub> <sup>(1)</sup>	—	—
文 界 ɿj	ɿjo <sub>(1)</sub> <sup>(1)</sup>	—	—
长 垌  j	ljeu <sub>(1)</sub> <sup>(1)</sup> 韵!	—	—

75. 娘母	养蒿	腊乙坪	大南山	石門坎	摆托	甲定	校坨	野鷄坡	楓香	韻類號
l	lh	(lh)*	l	l	l	lh	l	l	lh	
大	lhə <sub>(1)</sub> <sup>(1)</sup>	—	lo <sub>(1)</sub> <sup>(1)</sup>	lo <sub>(1)</sub> <sup>(1)</sup>	lau <sub>(1)</sub> <sup>(1)</sup>	lhə <sub>(1)</sub> <sup>(1)</sup>	lo <sub>(1)</sub> <sup>(1)</sup>	lu <sub>(1)</sub> <sup>(1)</sup>	lhau <sub>(1)</sub> <sup>(1)</sup>	(7)
帶子	lhə <sub>(1)</sub> <sup>(1)</sup> 聲!	—	lan <sub>(1)</sub> <sup>(1)</sup>	lau <sub>(1)</sub> <sup>(1)</sup>	lon <sub>(1)</sub> <sup>(1)</sup>	lhə <sub>(1)</sub> <sup>(1)</sup>	lua <sub>(1)</sub> <sup>(1)</sup>	—	lhə <sub>(1)</sub> <sup>(1)</sup>	(24)
燒山	—	—	leu <sub>(1)</sub> <sup>(1)</sup>	ley <sub>(1)</sub> <sup>(1)</sup>	lau <sub>(1)</sub> <sup>(1)</sup>	lhə <sub>(1)</sub> <sup>(1)</sup>	le <sub>(1)</sub> <sup>(1)</sup>	—	—	(13)
年輕	—	—	lua <sub>(1)</sub> <sup>(1)</sup>	la <sub>(1)</sub> <sup>(1)</sup>	lo <sub>(1)</sub> <sup>(1)</sup>	lhə <sub>(1)</sub> <sup>(1)</sup>	la <sub>(1)</sub> <sup>(1)</sup>	—	—	(5)

\*腊乙坪的反映形式是由養蒿的反映形式推測出來的。

76. 娘母	養蒿	臘乙坪	大南山	石門坎	擺托	甲定	校坨	野鷄坡	楓香	韻類號
l	l	l	l	l(fh)	l	l	l	l	l	
鐮刀①	len <sub>(1)</sub> <sup>(1)</sup> 韻!	—	lan <sub>(1)</sub> <sup>(1)</sup> 韻!	lie <sub>(1)</sub> <sup>(1)</sup> 韻!	len <sub>(1)</sub> <sup>(1)</sup>	le <sub>(1)</sub> <sup>(1)</sup>	læn <sub>(1)</sub> <sup>(1)</sup>	—	len <sub>(1)</sub> <sup>(1)</sup>	(18)
田	li <sub>(1)</sub> <sup>(1)</sup>	—	lan <sub>(1)</sub> <sup>(1)</sup>	lie <sub>(1)</sub> <sup>(1)</sup>	len <sub>(1)</sub> <sup>(1)</sup>	le <sub>(1)</sub> <sup>(1)</sup>	læn <sub>(1)</sub> <sup>(1)</sup>	len <sub>(1)</sub> <sup>(1)</sup>	len <sub>(1)</sub> <sup>(1)</sup>	(18)
薑米	li <sub>(1)</sub> <sup>(1)</sup>	—	lan <sub>(1)</sub> <sup>(1)</sup>	lie <sub>(1)</sub> <sup>(1)</sup>	lon <sub>(1)</sub> <sup>(1)</sup>	le <sub>(1)</sub> <sup>(1)</sup>	læn <sub>(1)</sub> <sup>(1)</sup>	lan <sub>(1)</sub> <sup>(1)</sup>	—	(22)
一重路	li <sub>(1)</sub> <sup>(1)</sup>	—	lie <sub>(1)</sub> <sup>(1)</sup>	—	lie <sub>(1)</sub> <sup>(1)</sup>	lie <sub>(1)</sub> <sup>(1)</sup>	—	lie <sub>(1)</sub> <sup>(1)</sup>	lie <sub>(1)</sub> <sup>(1)</sup>	(2)
煙人	lan <sub>(1)</sub> <sup>(1)</sup>	lan <sub>(1)</sub> <sup>(1)</sup>	lan <sub>(1)</sub> <sup>(1)</sup>	—	lon <sub>(1)</sub> <sup>(1)</sup>	lon <sub>(1)</sub> <sup>(1)</sup>	lon <sub>(1)</sub> <sup>(1)</sup>	lon <sub>(1)</sub> <sup>(1)</sup>	lan <sub>(1)</sub> <sup>(1)</sup>	(21)
喫懶了	lan <sub>(1)</sub> <sup>(1)</sup>	lan <sub>(1)</sub> <sup>(1)</sup>	—	—	lon <sub>(1)</sub> <sup>(1)</sup>	lu <sub>(1)</sub> <sup>(1)</sup>	lan <sub>(1)</sub> <sup>(1)</sup>	lan <sub>(1)</sub> <sup>(1)</sup>	lan <sub>(1)</sub> <sup>(1)</sup>	(15)
閃電②	li <sub>(1)</sub> <sup>(1)</sup>	li <sub>(1)</sub> <sup>(1)</sup>	lan <sub>(1)</sub> <sup>(1)</sup>	lan <sub>(1)</sub> <sup>(1)</sup>	lan <sub>(1)</sub> <sup>(1)</sup>	le <sub>(1)</sub> <sup>(1)</sup>	le <sub>(1)</sub> <sup>(1)</sup>	le <sub>(1)</sub> <sup>(1)</sup>	le <sub>(1)</sub> <sup>(1)</sup>	(10)

## BIBLIOGRAPHIC REFERENCES (SELECTED)

In addition to the above statistics for data in the STEDT *Main Lexicon*, the following references seek to document attested usages of and comments on curly-tail alveolo-palatal place series symbols. Comments on usage of specific symbols are appended to some entries below.

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1934 "The non-uniqueness of phonemic solutions of phonetic systems." Nanking: Extract from v. 4 of the Bulletin of the National research Institute of History and Philology, Academia Sinica. (363-398 p. 28 cm.) {UCB Main P221; .C5.}

• **International Phonetic Association (IPA)**

2000 Current Charts Available at <<http://www.arts.gla.ac.uk/IPA/ipa.html>>. See specifically, <<http://www2.arts.gla.ac.uk/IPA/symbols.html>> for the Chart of OTHER SYMBOLS.

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• **LI Zhenhua** 李珍華 and ZHOU Changji 周長楫

1993 《漢字古今音表》，〔美〕李珍華，周長楫編撰。北京：中華書局。<Han Zi Gu Jin Yin Biao> [Historical Chinese Phonologic Tables]. Li Zhenhua and ZHOU Changji. Beijing: Zhonghua Shu Ju, 1993. {Harvard Yenching Library Number: 5120 4414; ISBN 7-101-01198-5/H.103.} 8,865 char. readings in 3 historical periods and 7 modern dialects. This work employs [ ʈ, ɕ, ɳ, ʑ, ʒ ] in reconstructions of Old Chinese (上古); [ ʈ, ɕ, ʑ, ʒ ] in transcriptions of Middle Chinese (中古); [ ɳ, ʑ, ʒ ] for the modern Wu dialect (吳語); [ ɳ, ʑ ] for the modern Gan dialect (贛語); [ ɳ ] for the modern Kejia (客家話) dialect. Many of LI and ZHOU's historical forms were also cited in RSC-ECC (COOK 1995).

• **LIANG Min** 梁民 (sp?) and ZHANG Junru

1996 《侗台語族概論》 <Dong-Tai yuzu gailun> [Intro to Kam-Tai languages]. Beijing: Zhongguo shehui kexue chubanshe. Cf. pp. 972-973. {UCB TEMP98 3754 EAST.}

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• **NIEDERER, Barbara**

1998 *Les langues Hmong-Mjen (Miao-Yao):phonologie historique*. Munchen : Lincom Europa. {ISBN: 3-89586-211-8; UCB PL 4070 N543 1998 MAIN.} This text uses serif forms of [ ɭ ].

• **PULLUM, Geoffrey K.** and William A. LADUSAW.

1996 *Phonetic Symbol Guide*, Second Edition. Chicago, London: University of Chicago Press. {ISBN 0-226-68536-5.}

• **QIAN Nairong** 錢乃榮

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- **Unknown Committee** 中國大百科全書編輯委員  
**1988** 《中国大百科全书》 <Zhongguo dabaike quanshu> [Great Chinese Encyclopedia]. Beijing: Zhongguo dabaike quanshu chubanshe. Cf. Yuyan-Wenzi vol., p.118 (IPA).
- **WANG Fushi** 王輔世 and **MAO Zongwu** 毛宗武  
**1995** 《苗瑤語古音構擬》，王輔世,毛宗武 著。北京: 中國社會科學出版社。 <Miao-yao Yu Gu Yin Gou Ni> [Reconstruction of Proto-Miao-Yao language]. Beijing: Chinese Social Sciences Press. {ISBN 7-5004-1383-1; UCB PL 4070 W36 1995 EAST.} This text uses serif forms of [ ɬ ].
- **WANG Fushi** 王輔世  
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## STEDT *Source Bibliography* ABBREVIATIONS

The Sino-Tibetan Etymological Dictionary and Thesaurus (STEDT) Project *Source Bibliography* abbreviations cited above are as follows (numbers at the end of each entry indicate the total number of records in the STEDT databases from each source):

- |            |                   |              |              |
|------------|-------------------|--------------|--------------|
| • AW-TBT   | = WEIDERT, 1987.  | • RSC-ECC    | = COOK.      |
| • CSL-YIzd | = CHEN, 1979.     | • SHK-Sulung | = SUN, 1993. |
| • DHFRL    | = DAI, 1991.      | • SLZO-MLD   | = SUN 1980.  |
| • JP-Idu   | = PULU, 1978.     | • TBL        | = DAI, 1992. |
| • LTBA     | = MATISOFF 1974-. | • ZMYYC      | = SUN 1991.  |

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