### (1) Abstract

We propose a linguistically motivated approach based on segmenting a source phrase using dependency structure and translating each phrase with PBSMT. This work presents the results of our method on Japanese-English translation and discusses potential improvements.

1. Our method creates a basic frame and

3. The anchor words of the basic frame are

replaced with the translations of the

words : the yellow under-lined words)

線量≥

are translated by a decoder.

DERSソフトウエアを

optimized for translating phrases.

Algorithm

# Source Phrase Segmentation and Translation for Japanese to English Translation Using Dependency Structure

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	BLEU	RIBES
no-seg&trans	18.32	0.641456
seg&trans	15.85	0.628897
seg&trans (w/o prep)	15.72	0.628463

no-seg&trans ... Standard Moses output seg&trans ... The first method seg&trans ... The second method

## (5) Error Analysis (in 100 sentences)

We investigate the reason why BLEU and RIBES fall off. The number of the pairs of input and reference that have different voices (active or passive) is 35.

We observed that translation of dependent phrases is the most frequent error type. It is because the language and the translation models are not optimized for translating phrases.

error types Dependency parsing Translation of a basic f Translation of dependen Total (Each error may o

Error Example Translation of the basic frame

<ul> <li>Translation of</li> </ul>	the d
"解決を"	"Dł
$\checkmark$	
"We solve"	<u>"In</u>
$\rightarrow$ Not an NP	$\rightarrow$ /

### 6 Conclusion & Future Work

- have three problems: a dependency translation of dependent phrases.
- We plan to optimize the language and the

### 2 Source Phrase Segmentation and Translation Using Dependency Structure An example of the first method dependent phrases. (Basic frame : broken line circle, Dependent phrases : solid line circle.) DERSソフトウエアを用いて「ふげん発電所」の線量率を詳細に計算できる Creating the basic frame 2. The basic frame and the dependent phrases Creating dependent phrases by extracting phrases that depend on the predicate by segmenting the sentence 用いて線量率を詳細に計算できる "DERSソフトウェアフトウエアを用いて", "「ふげん発電所」の線量率を", "詳細に", "計算できる" Translation for extracting the predicate and alignment corresponding dependent phrases. (Anchor \* Replacing dependent phrases with their translated counterparts except for the predicate Translation Used dose rate can be calculated in d Peplace Replace *leplace* "Using DERS software", "the dose rate 'Fugen power plant", "detailed", "calculated" Using DERS software the dose rate 'Fugen power plant' can be calculated detailed Output An example of the second method ③ Experimental Settings Used dose rate can be calculated in detail Decoder : Moses (2.1.1) default settings Corpus : The ASPEC (3 million parallel Output sentences) "Using DERS software", Segmentation : JUMAN (7.0) "the dose rate `Fugen power plant" Alignment : GIZA++ (1.0.7) "detailed" MERT : Performed on the full dev-set Dependency : CaboCha(0.68) Baseline : Standard output translation models optimized for a sentence, our Jsing DERS software the dose rate first method might not be able to use a model Our method only uses CaboCha for creating Fugen power plant can be calculated in detailed a basic frame and dependent phrases. (Not

segmentation)

「ふげん発電所」 The difference between the first and second methods is not to replace a preposition that follows the predicate in the basic frame. Because the translation of dependent phrases in our first method uses the language and

# (4) Experimental Results

	frequency
	3
rame	18
nt phrases	46
overlap)	57

"雷撃比は等しい" J. "The equal to lightning stroke ratio" → Ungrammatical Sentence

dependent phrases

ERSIこ"  $\downarrow$ n DERS" Missing context

Our finding is that our proposed methods parsing, translation of a basic frame and

translation models for translating phrases.