

I/We Claim:

1. A coding method for polar codes, comprising:
 - a. providing to-be-encoded input bits that include free bits and remaining bits;
 - b. dividing the remaining bits into a plurality of fragments;
 - 5 c. providing a connection code;
 - d. connecting one fragment of the remaining bits to the connection code to thereby form a connected fragment, while the remaining being still unconnected fragments;
 - e. performing polarization coding to the free bits, the connected fragment, and
 - 10 the unconnected fragments to obtain the polar codes.

2. The coding method according to claim 1, wherein a length of the fragment connected to the connection code is smaller than the free bit.

- 15 3. The coding method according to claim 1, wherein a length of the connection code is smaller than a total length of the input bits.

4. The coding method according to claim 1, wherein in step b, bit error rates of different bits in each fragment are substantially identical, the connection code is
- 20 configured to reduce the bit error rate of the fragment connected therewith, and the connection code does not need cyclic redundancy check; optionally, the unconnected fragments are set to a preset bit known to both of the transmitting and receiving parties upon polarization coding.

- 25 5. A decoding method for polar codes, comprising:
 - receiving a coded codeword from a transmitting end, the coded codeword being generated by coding to-be-coded input bits via a connection code and polar codes in accordance with any one of claims 1 to 4; and
 - decoding the coded codeword to restore the input bits.

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6. The decoding method according to claim 5, comprises:
 - receiving an indication from the transmitting end, the indication being for informing any one of the following items:

- whether the transmitting end uses the connection code to code the polar codes;

- how many fragments the remaining bits other than free bits in the input but are divided at the transmitting end;

- 5 - whether each of the fragments is connected to the connection code;
- a type and relevant configuration parameters of the connection code;
- a code rate of the connection code;
- and a composing/ interleaving scheme of each fragment.

10 7. An encoder for polar codes, comprising:

 a first unit configured to provide to-be-encoded input bits that include free bits and remaining bits;

 a second unit configured to divide the remaining bits into a plurality of fragments;

15 a third unit configured to provide a connection code;

 a fourth unit configured to connect one fragment of the remaining bits to the connection code to thereby form a connected fragment, while the remaining being still unconnected fragments;

20 a fifth unit configured to perform polarization coding to the free bits, the connected fragment, and the unconnected fragments to obtain the polar codes.

 8. The encoder according to claim 7, wherein a length of the fragment connected to the connection code is smaller than the free bit.

25 9. The encoder according to claim 7, wherein a length of the connection code is smaller than a total length of the input bits.

 10. The encoder according to claim 7, wherein bit error rates of different bits in each fragment are substantially identical.

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 11. The encoder according to claim 7, wherein
 the third unit is configured to provide a plurality of different connection codes;
 and

 the fourth unit is configured to connect a plurality of different connection

codes with a plurality of different fragments of the remaining bits to form a plurality of connected fragments, while the remaining are unconnected fragments, and wherein the connection codes are configured to reduce the bit error rate of the fragments connected therewith, and the connection codes need no cyclic redundancy check; the
 5 unconnected fragments are set to a preset bit known to both of the transmitting and receiving parties upon polarization coding.

12. A decoder for polar codes, comprising: a sixth unit configured to receive a coded codeword from a transmitting end, the coded codeword being generated by
 10 coding to-be-coded input bits via a connection code and the polar codes in accordance with any one of claims 1 to 4; and

a seventh unit configured to decode the coded codeword to restore the input bits.

15 13. The decoder according to claim 12, further comprising:

an eighth unit configured to receive an indication from the transmitting end, the indication being for informing any one of the following items:

- whether the transmitting end uses the connection code to code the polar codes;
- 20 - how many fragments the remaining bits other than free bits in the input but are divided at the transmitting end;
- whether each of the fragments is connected to the connection code;
- a type and relevant configuration parameters of the connection code;
- a code rate of the connection code;
- 25 - and a composing/ interleaving scheme of each fragment.