We implement a fixed-rate Spinal code [1]. The core idea of the encoder is the sequential application of a hash function which has two inputs:a v-bit state v_{i-1} and a k bits message $\overline{c}_i$. The output of the hash function is a new v-bits state s_i:

$$s_i = h(s_{i-1}, \overline{c}_i), s_0 = 0^v \tag{1}$$

Each State s_i is called a spine and it is used to seed a random number generator (RNG) to generate a sequence of L pseudo-random q-bit numbers. Finally, the q bits of each pseudo random number are mapped to symbols x_i chosen from a given constellation and sent. The encoding process is illustrated in. When Spinal codes have a fixed code rate, it is given by $R = k/(L \cdot q)$