[0221] In some embodiments, correlation module **400** determines the correlation quality **508** for that uplink beam **130** by correlating the signal sequence **606** received via each uplink beam **130** with each known training sequence **608**. In one such embodiment, the correlation quality **508** for each uplink beam **130** is the best correlation determined between the signal sequence **606** received via that uplink beam **130** and each known training sequence **608**.

[0222] In other embodiments, correlation module **400** determines the correlation quality for each uplink beam **130** by correlating that uplink beam **130** with one or more appropriate training sequences **605**, rather than each of the known training sequences **608**. The one or more appropriate training sequences **605** may be selected from the known training sequences **608** by known training sequence selection device **604** based on relevant signaling information **180** received from signaling information monitoring system **106**. For example, known training sequence selection device **604** may be operable to determine which mobile station **15** is communicating in a particular time slot based on relevant signaling information **180**, and select the known training sequence **608** that is expected to be received from that mobile station **15** as the appropriate training sequence **605**.

[0223] The correlation qualities **508** determined by correlation module **400** may be used as input by beam selection modules **404** for use in selecting receiving beam selections **126** and/or transmitting beam selections **124**. In particular, correlation qualities **508** may be used as input by smart decision beam selection module **410** in determining a quality factor **550** of each uplink beam **130**.

[0224] In one embodiment, correlation algorithm **602** may determine the correlation quality **508** of each uplink beam **130** as follows:

$$\forall\, i,\ j\ \ CORR[i,\ j] = \sum_{n=0}^{N} Y_i(n+j) * \text{Training\_}s^H(N-n) \tag{15}$$

$$\forall\, i,\ j\ \ \text{SUM\_CORR}[i,\ j] = \sum_{k=0}^{K} CORR[i,\ j+k] \tag{16}$$

$$\text{BEST\_CORR}(i) = \max_j \{\text{SUM\_CORR}[i,\ j]\} \tag{17}$$

Where:

[0225] $Y_i(n)$ indicates the received signal from the receiver after it was sampled;

[0226] i indicates the number of the beam being analyzed;

[0227] j indicates the length of the correlation window, which may be a particular time period or number of frames;

[0228] Training_s(n) indicates the expected known training sequence **608**;

[0229] N indicates the length of each training sequence;

[0230] K indicates the maximum number of multi-paths considered by the algorithm;

[0231] CORR[i,j] indicates the correlation between the received signal $Y_i(n)$ and the expected known training sequence, Training_s(n); and

[0232] BEST_CORR(i) indicates the correlation quality **508** of the beam being analyzed.

[0233] If the appropriate one of the known training sequences **608** is not known (for example, in an embodiment in which relevant signaling information **180** is not used to determine one or more appropriate training sequences **605**), equations (15) through (17) may be repeated for each known training sequence **608**. The correlation quality **508**, BEST_CORR(i), of the uplink beam **130** being analyzed may then be determined as follows:

$$\text{BEST\_CORR}[i,\text{num}] = \max_j \{\text{SUM\_CORR}[i,j]\} \tag{18}$$

$$\text{BEST\_CORR}(i) = \max_{\text{num}} \{\text{BEST\_CORR}[i,\text{num}]\} \tag{19}$$

[0234] In some embodiments, BEST_CORR(i) for each uplink beam **130** may be used by uplink quality factor algorithm **540** as the Corr_Quality parameter in equation (14) above.

[0235] FIG. **20** illustrates a method of determining a correlation quality **508** for a particular uplink beam **130** by correlating the signal sequence **606** communicated by the uplink beam **130** with each known training sequence **608**. At step **630**, the method starts. At step **632**, the uplink beam **130** is received by correlation module **400**. In one embodiment, uplink beam **130** is received from one of the receiving units **108**. At step **634**, correlation module **400** correlates signal sequence **606** with each known training sequence **608** to determine a set of correlations including a correlation for each known training sequence **608**. In particular, correlation module **400** may execute at least a portion of correlation algorithm **602** to determine the correlation between signal sequence **606** and each known training sequence **608**. At step **636**, correlation module **400** may determine the correlation quality **508** of uplink beam **130** by determining the best correlation in the set of correlations. The method may then return to step **632** to receive another signal sequence **606** via uplink beam **130**. In one embodiment, a new correlation quality **508** is determined for the signal sequence **606** received via uplink beam **130** in each time slot during an ongoing call. It should be

[0236] understood that the method illustrated in FIG. **20** may be used to determine a correlation quality **508** for each uplink beam **130**.

[0237] FIG. **21** illustrates a method of determining a correlation quality **508** for a particular uplink beam **130** by correlating the signal sequence **606** communicated by the uplink beam **130** with one appropriate known training sequence **608**. At step **650**, the method starts. At step **652**, the uplink beam **130** is received by correlation module **400**. At step **654**, known training sequence selection device **604** may select from the known training sequences **608** an appropriate training sequence **605** with which to correlate signal sequence **606**. In one embodiment, known training sequence selection device **604** selects appropriate training sequence **605** based on relevant signaling information **180** received from signaling information monitoring system **106**. At step **656**, correlation module **400** correlates signal sequence **606** with appropriate training sequence **605** selected at step **654** to determine the correlation quality **508** of uplink beam **130**. In particular, correlation module **400** may execute at least a portion of correlation algorithm **602** to determine the correlation quality **508** of uplink beam **130**. The method may then return to step **652** to receive another