decision beam selection module **410**, as well as to storage module **406**. Storage module **406** includes a parameter database **510** operable to store data regarding one or more inputs or parameters, such as correlation qualities **508** and signal strengths **438**, for example. Storage module **406** may be operable to supply smart decision beam selection module **410** with data from parameter database **510** for use in determining smart decision beam selections **506**.

[**0201**] In operation, quality factor algorithm **504** may be operable to receive correlation qualities **508** and signal strengths **438** from correlation module **400** and signal strength module **402**, respectively, in real time, as well as stored data from parameter database **510**, in order to determine a quality factor for each uplink beam **130**. Buffer **502** may receive one or more of the quality factors and determine provisional beam selection **512**. Beam selection verification module **514** may then determine whether to verify provisional beam selection **512** based on relevant signaling information **180**. If provisional beam selection **512** is verified, it may be selected as the smart decision beam selection **506**. This system is discussed in greater detail below with reference to FIG. **17**.

[**0202**] FIG. **17** illustrates relevant details and operation of smart decision selection module **410** in accordance with one embodiment of the present invention. As discussed above, smart decision selection module **410** may include quality factor algorithm **504**, buffer **502**, and beam selection verification module **514**. Quality factor algorithm **504** may include uplink weights **520** and downlink weights **522**. Uplink weights **520** may include uplink parameter weights **524** and uplink history weights **526**. Uplink parameter weights **524** may include uplink correlation quality weight **528** and uplink signal strength weight **530**. Similarly downlink weights **522** may include downlink parameter weights **532** and downlink history weights **534**. Downlink parameter weights **532** may include downlink correlation quality weight **536** and downlink signal strength weight **538**.

[**0203**] In general, uplink weights **520** are used by uplink quality factor algorithm **520** to determine uplink quality factors **550** corresponding to each uplink beam **130** based on one or more inputs or parameters. In particular, parameter weights **524** are used to weight the significance of each parameter used in determining uplink quality factors **550**. Uplink correlation quality weight **528** and uplink signal strength weight **530** are used to weight the significance of the correlation quality and signal strength, respectively, of each uplink beam **130** in determining uplink quality factors **550**. History weights **526** are used to weight the significance of each or one or more samples of the parameters. In some embodiments, history weights **526** are used to weight particular determinations, such as the correlation quality and signal strength of each uplink beam **130**, based on the time slot or frame in which the determinations were made.

[**0204**] Similarly, downlink weights **522** may be used by downlink quality factor algorithm **520** to determine downlink quality factors corresponding to each uplink beam **130**. It should be noted that although FIG. **17** focuses on the determination of uplink smart decision beam selection **506**, downlink smart decision beam selection **507** may be determined in a similar manner. However, in some embodiments, one or more downlink weights **522** are different from their corresponding uplink weights **526**, and thus the resulting downlink smart decision beam selection **507** may be different than the uplink smart decision beam selection **506** determined based on the same inputs or parameters.

[**0205**] The following discussion relates to the operation of smart decision beam selection module **410** in determining uplink smart decision beam selection **506**. Uplink quality factor algorithm **540** may determine an uplink quality factor **550** for each uplink beam **130** based on one or more inputs, including correlation qualities **508** and signal strengths **438** for each uplink beam **130**. In particular, uplink quality factor algorithm **540** may receive correlation qualities **508** and signal strengths **438** determined based on a current or most recent time slot of each uplink beam **130**, which may be referred to as time slot "t." Uplink quality factor algorithm **540** may also base its determination of each uplink quality factor **550** on information from parameter database **510**, including correlation qualities **508** and signal strengths **438** determined based on one or more prior time slots of each uplink beam **130**, which may be referred to as time slots "t-**1**,""t-**2**," and so on.

[**0206**] In one embodiment, uplink quality factor algorithm **540** determines the uplink quality factor ("QF") **550** for each uplink beam **130** using the following equation:

$$\begin{aligned} QF(i) = a1 * \{ & b1 * \text{Corr\_Quality}(i, t) + b2 * \text{Corr\_Quality}(i, t-1) + \\ & b3 * \text{Corr\_Quality}(i, t-2) + b4 * \text{Corr\_Quality}(i, t-3) + \\ & \ldots + bn * \text{Corr\_Quality}(i, t-n-1)\} + \\ & a2 * \{c1 * \text{Sig\_Strength}(i, t) + c2 * \text{Sig\_Strength}(i, t-1) + \\ & c3 * \text{Sig\_Strength}(i, t-2) + c4 * \text{Sig\_Strength}(i, t-3) + \\ & \ldots + ck * \text{Sig\_Strength}(i, t-k-1)\} \end{aligned} \quad (14)$$

where:

[**0207**] "i" indicates the beam number,

[**0208**] "T" indicates the time,

[**0209**] Corr_Quality indicates the correlation quality of the beam,

[**0210**] Sig_Strength indicates the signal strength of the beam, and

[**0211**] a**1**+a**2**+ . . . =b**1**+b**2**+b**3**+b**4**+ . . . +bn=c**1**+c**2**+c**3**+ c**4**+ . . . +ck=1

[**0212**] Smart decision beam selection module **410** may be operable to select the number of the beam having the highest uplink quality factor **550**, shown in FIG. **17** as best quality beam number **552**. In some embodiments, uplink quality factor algorithm **540** is operable to determine a quality factor **550** for each uplink beam **130**, as well as a best quality beam number **552**, in each time slot in each frame.

[**0213**] The best quality beam number **552** may be received by buffer **502**, which may include a decision storage system **554** operable to store one or more previously determined best quality beam numbers **552**. In some embodiments, decision storage system **554** may be operable to store one or more previously determined best quality beam numbers **552** for each time slot, or traffic channel, in the relevant frequency. Buffer **502** may be operable to select a provisional