parameter is set to ¼ and the offset for different PRB 1st values varies from 0 to 4. This results uplink index values from 0 to 9. In the second example of Table 3B granularity is set to 2, the offset varying from 0 to 4. In this example uplink indices vary from 0 to 51.

[0058] The embodiments may provide a scalable solution for the PUCCH resource dimensioning. This can be used to allow to trade-off between scheduler flexibility and PUCCH overhead. Existing parameters such as antenna port and scrambling indicator can be utilised in handling a MU-MIMO scenario. In a particular embodiment ePDCCH scheduling (e.g. search space and link adaptation) can be kept independent from PUCCH resource allocation. This can simplify the scheduler operation. It is also an advantage that the same AIN resource pool can be used for PUCCH HARQ ACK/NACKs for legacy user equipment and ePDCCH enabled user equipment.

[0059] It is noted that whilst embodiments have been described in relation to LTE, similar principles can be applied to any other communication system or to further developments with LTE. Also, instead of scheduling that is provided by a control apparatus associated with a base station scheduling may be provided by any apparatus for scheduling transmissions in two directions between at least two devices. Thus, although the embodiments are described with references to uplink and downlink, these terms should not be understood as limiting as the disclosure is not limited by the directions between a base station and a user terminal. Instead, the invention is applicable to any system where a control apparatus can schedule transmissions between two or more communicating entities, wherein the scheduling entity can be seen as being in the "upper" end of the link. For example, this may be the case in application where no fixed equipment provided but a communication system is provided by means of a plurality of user equipment, for example in adhoc networks. Therefore, although certain embodiments were described above by way of example with reference to certain exemplifying architectures for wireless networks, technologies and standards, embodiments may be applied to any other suitable forms of communication systems than those illustrated and described herein.

[0060] The required data processing apparatus and functions of a base station apparatus, a communication device and any other appropriate apparatus may be provided by means of one or more data processors. The described functions at each end may be provided by separate processors or by an integrated processor. The data processors may be of any type suitable to the local technical environment, and may include one or more of general purpose computers, special purpose computers, microprocessors, digital signal processors (DSPs), application specific integrated circuits (ASIC), gate level circuits and processors based on multi core processor architecture, as non limiting examples. The data processing may be distributed across several data processing modules. A data processor may be provided by means of, for example, at least one chip. Appropriate memory capacity can also be provided in the relevant devices. The memory or memories may be of any type suitable to the local technical environment and may be implemented using any suitable data storage technology, such as semiconductor based memory devices, magnetic memory devices and systems, optical memory devices and systems, fixed memory and removable memory.

[0061] In general, the various embodiments may be implemented in hardware or special purpose circuits, software, logic or any combination thereof. Some aspects of the invention may be implemented in hardware, while other aspects may be implemented in firmware or software which may be executed by a controller, microprocessor or other computing device, although the invention is not limited thereto. While various aspects of the invention may be illustrated and described as block diagrams, flow charts, or using some other pictorial representation, it is well understood that these blocks, apparatus, systems, techniques or methods described herein may be implemented in, as non-limiting examples, hardware, software, firmware, special purpose circuits or logic, general purpose hardware or controller or other computing devices, or some combination thereof. The software may be stored on such physical media as memory chips, or memory blocks implemented within the processor, magnetic media such as hard disk or floppy disks, and optical media such as for example DVD and the data variants thereof, CD.

[0062] The foregoing description has provided by way of exemplary and non-limiting examples a full and informative description of the exemplary embodiment of this invention. However, various modifications and adaptations may become apparent to those skilled in the relevant arts in view of the foregoing description, when read in conjunction with the accompanying drawings and the appended claims. However, all such and similar modifications of the teachings of this invention will still fall within the scope of this invention as defined in the appended claims. Indeed there is a further embodiment comprising a combination of one or more of any of the other embodiments previously discussed.

1. An apparatus for the allocation of resources for wireless communications, the apparatus comprising: at least one processor; and

at least one memory including computer program code, wherein the at least one memory and the computer program code are configured, with the at least one processor, to

determine an index for an uplink control resource in accordance with a predefined rule, the determining taking into account an index associated with a physical downlink resource and the amount of downlink resources to be mapped on the uplink control resource.

2. The apparatus according to claim **1**, wherein the at least one memory and the computer program code are further configured, with the at least one processor, to take into account the lowest index of the physical downlink resource block.

3. The apparatus according to claim **1**, wherein the index associated with the physical downlink resource comprises the index of at least one of an enhanced control channel element, an enhanced physical downlink control channel and a physical downlink shared channel scheduled by means of an enhanced physical downlink control channel.

4. The apparatus according to claim **1**, wherein the at least one memory and the computer program code are further configured, with the at least one processor, to use an offset in determining the index for the uplink control resource.

5. The apparatus according to claim **4**, wherein the at least one memory and the computer program code are further configured, with the at least one processor., to use at least one of an antenna port indicator and a scrambling identity in defining the offset.